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4-celled. *Seeds* numerous, obliquely oblong.—**DISTRIB.** Species 10, Indian and tropical or southern Africa.

1. **S. indicum**, *DC. Prodr.* ix. 250; erect, leaves oblong or ovate lower often pedatisect, capsule tetragonous oblong, seeds brown smooth. *Wall. Cat.* 6408; *Wight Ill.* t. 163; *Bot. Mag.* t. 1688; *Dalz. & Gibs. Bomb. Fl.* 161. *S. orientale*, *Linn.*; *Gaertn. Fruct.* ii. 132, t. 110; *Lamk. Ill.* t. 528; *Roxb. Fl. Ind.* iii. 100. *S. luteum*, *Retz. Obs.* vi. 31; *DC. l. c.* *S. occidentale*, *Heer & Regel*; *DC. l. c.*; *Thwaites Enum.* 442.—*Rumph. Herb. Amboin.* t. 76, fig. 1. *Rheede Hort. Mal.* ix. tt. 54, 55.

Throughout the warmer parts of INDIA and CEYLON, cultivated.—**DISTRIB.** Cultivated in all hot countries. Native country doubtful, probably Asiatic.

Height 1–2 ft., pubescent or puberulous. *Leaves* 3–5 in., variable on the same plant; upper often narrowly oblong subentire, middle ovate toothed, lower lobed or pedatisect; petiole  $\frac{1}{2}$ –2 in. *Pedicels*  $\frac{1}{2}$  in., solitary, rarely 2–3-nate. *Sepals*  $\frac{1}{4}$  in., lanceolate. *Corolla*  $1\frac{1}{4}$  in., pubescent, whiteish or with red purplish or yellow marks. *Capsule* 1 by  $\frac{1}{4}$  in., erect, scabrid-pilose, the same width from top to bottom, usually shortly acuminate; 2-valved half-way down, or sometimes to the base, or ultimately 4-valved.

2. **S. laciniatum**, *Klein*; *Willd. Sp. Pl.* iii. 359; prostrate, hispid, leaves ovate lobed and deeply subpedately pinnatifid, capsule ovoid compressed, seeds black reticulate. *DC. Prodr.* ix. 209; *Wight Ic.* t. 1345.

**S. DECCAN PENINSULA**, *Rottler, Wight, &c.*; *Cochin, Johnstone.*

Appressedly prostrate, 1–3 ft., branching. *Leaves*  $\frac{1}{2}$ – $1\frac{1}{2}$  in., orbicular or elliptic in outline, lacinations acute; petiole 0– $\frac{1}{6}$  in. *Pedicels*  $\frac{1}{6}$  in., solitary. *Sepals*  $\frac{1}{8}$  in., lanceolate. *Corolla* 1 in., minutely pubescent, purple, yellow in the palate. *Capsule*  $\frac{1}{2}$  by  $\frac{1}{3}$  in., scabrous-pilose, shortly mucronate; valves 2, dorsally compressed.

3. **S. prostratum**, *Retz. Obs.* iv. 28; prostrate, villous, leaves orbicular or obovate crenate or obtusely lobed with white indumentum beneath, capsule ovoid compressed, seeds black reticulate. *Wall. Cat.* 6409; *Wight Ic.* t. 1346.

**MADRAS**; especially on sandhills near the sea, *Rottler, Wight, Shuter.*

Closely allied to *S. laciniatum*, and hardly separable therefrom by the characters given. The leaves are generally entire, sometimes 3-lobed half-way; the teeth never sharp as in *S. laciniatum*.

#### ORDER CIX. **ACANTHACEÆ.** (By C. B. Clarke.)

Herbs or shrubs, rarely trees. *Leaves* opposite, exstipulate, very rarely divided. *Flowers* rarely solitary, bracteate and 2-bracteolate. *Calyx* 5-partite (in *Thunbergia* small often multifid). *Corolla* 2-lipped, or subequally 5-lobed; lobes imbricated or twisted in bud. *Stamens* 4 or 2, inserted on the corolla-tube; anthers 2- or 1-celled; cells sometimes remote. *Disc* often conspicuous. *Ovary* superior, 2-celled; style filiform, notched or bifid (1 branch often obsolete); ovules one or more in each cell, 1- or 2-seriate, anatropous. *Capsule* loculicidal; valves often elastically recurved, carrying the seeds on the half-septa. *Seeds* (except in *Thunbergia* and the *Nelsoniæ*) hard, seated on upcurved subacute supports (*retinacula*), ovoid or compressed, testa smooth rugose or warted rarely hispid, often clothed with white elastic hairs (best seen when wetted), albumen 0 (except *Nelsoniæ*); radicle next the hilum.—Species 1500, in the tropical and warm temperate regions.



Tribe 1. **Thunbergiæ**. Scandent or twining. *Calyx* minute, annular or 10-15-toothed. *Corolla-lobes* twisted in bud. *Ovules* 2 in each cell, collateral. *Capsule* beaked; retinacula 0 . . . 1. THUNBERGIA.

Tribe 2. **Nelsoniæ**. *Corolla-lobes* imbricate in bud. *Ovules* many, superimposed in two rows in each cell. *Seeds* small, seated on minute papillæ, not on hard retinacula, obscurely albuminous.

Calyx 4-partite. Stamens 2. Bracts rigid, imbricate .	2. ELYTRARIA.
Calyx 4-partite. Stamens 2. Bracts herbaceous . .	3. NELSONIA.
Calyx 5-partite. Stamens 4 . . . . .	4. EBERMAIERA.
Calyx 5-partite. Stamens 2, exserted . . . . .	5. OPHIORRHIZIPHYLLUM.

Tribe 3. **Ruellieæ**. *Corolla-lobes* twisted to the left in bud. *Seeds* on retinacula. *Sepals* 5, or 4 with one larger. *Anthers* usually 2-celled; cells parallel or one a little below the other. *Style* 2-fid, one lobe often suppressed.

Subtribe 1. POLYSPERMEÆ. *Ovules* 3-12 in each cell. *Capsule* normally 6- or more-seeded.

\* *Corolla distinctly 2-lipped.*

Lower leaves often toothed or pinnatifid. Flowers axillary, sessile. Retinacula scarcely hooked . . .	6. CARDANTHERA.
Leaves entire. Flowers axillary, subsessile. Retinacula hooked . . . . .	7. HYGROPHILA.
Cymes elongate. Branches sympodal . . . . .	8. NOMAPHILA.

\*\* *Corolla subequally 5-lobed.*

Bracteoles large. Stamens muticous. Capsule clavate. Base of capsule solid . . . . .	10. RUELLIA.
Cymes elongate with sympodal branches. Anther-cells mucronate at base . . . . .	11. ECHINACANTHUS.
Flower-clusters separate on the cyme-branches. Connective excurrent at tip. Capsule seed-bearing from the base . . . . .	17. ÆCHMANTHERA.
Flowers capitate or axillary, subsessile. Bracteoles small, narrow, or 0. Capsule seed-bearing from the base . . . . .	15. HEMIGRAPHIS.
Flowers clustered at the nodes of the almost leafless branches in terminal panicles. Stamens muticous. Capsule seed-bearing from the base . . . . .	16. STENOSIPHONIUM.

Subtribe 2. TETRASPERMEÆ. *Ovules* 2 in each cell. *Capsule* 4- or fewer-seeded.

\* *Placentæ not rising elastically from the base of the capsule* (except in a few *Strobilanthes*).

Corolla subequally 5-lobed. Stamens 4 or 2; anthers muticous . . . . .	18. STROBILANTHES.
Corolla large, deeply 2-lipped. Stamens 4; anthers muticous . . . . .	19. CALACANTHUS.
Corolla somewhat 2-lipped. Stamens 4; anthers minutely mucronate at base . . . . .	9. CALOPHANES.
Corolla-tube very long, linear; lobes subequal. Stamens 2 . . . . .	14. DÆDALACANTHUS.

\*\* *Placentæ rising elastically from the base of the ripe capsule.*

Corolla small. Stamens 4. Bracteoles 0 . . . . .	13. PHAYLOPSIS.
Stamens 4. Bracteoles very large, reticulately nerved .	12. PETALIDIUM.



Tribe 4. **Acantheæ.** *Corolla-tube* short; upper lip obsolete, lower 3-lobed. *Ovules* 2 in each cell. *Retinacula* curved, hardened.

Anterior filaments with an excurrent process . . . . . 20. BLEPHARIS.  
Anterior filaments without an excurrent process . . . . . 21. ACANTHUS.

Tribe 5. **Justicieæ.** *Corolla-lobes* imbricate in bud. *Retinacula* curved, hardened. *Anthers* 2-1-celled; cells often spurred at the base, one frequently placed much above the other. *Style* shortly equally 2-fid or subentire.

Subtribe 1. ANDROGRAPHIDÆ. *Ovules* 3-10 in each cell. *Capsule* normally 6- or more-seeded.

\* *Capsule compressed at right angles to the septum; seeds ovoid, hardly compressed.*

Flowers paniced or thyrsoid . . . . . 28. ANDROGRAPHIS.  
Flowers axillary, clustered, with cladodes (suppressed branchlets) among them . . . . . 29. HAPLANTHUS.

\*\* *Capsule subterete, seeds much compressed.*

Corolla-tube very slender, limb small . . . . . 30. GYMNOSTACHYUM.  
Corolla cylindric, curved, not ventricose nor deeply 2-lipped . . . . . 31. PHLOGACANTHUS.  
Corolla ventricose, not deeply 2-lipped . . . . . 32. CYSTACANTHUS.  
Corolla deeply 2-lipped . . . . . 33. DIOTACANTHUS.

Subtribe 2. BARLERIÆ. *Ovules* 2-1 in each cell. *Corolla-lobes* 5, subequal. *Stamens* 4, of which 2 are small or obsolete, or 4 1-celled.

Sepals 4, 2 outer opposite larger. *Anthers* 2-celled . . . . . 22. BARLERIA. p. 482  
Calyx 2-lipped, 5-lobed. *Anthers* 2-celled . . . . . 23. NEURACANTHUS.  
Outer calyx-lobes much the larger. *Anthers* 1-celled . . . . . 24. CROSSANDRA.

Subtribe 3. ASYSTASIEÆ. *Ovules* 2 in each cell. *Corolla-lobes* 5, subequal. *Sepals* 5, small, subequal. *Stamens* 4 or 2; anther-cells 2, subequal, parallel, muticous.

Corolla-tube long, narrow or subventricose. *Stamens* 4 . . . . . 25. ASYSTASIA.  
Corolla-tube slender. *Stamens* 2 . . . . . 26. ERANTHEMUM.  
Corolla-tube ventricose. *Stamens* 2 . . . . . 27. CODONACANTHUS.

Subtribe 4. EUJUSTICIEÆ. *Ovules* 2 in each cell. *Corolla* distinctly 2-lipped.

\* *Stamens* 4, *anthers* all subequal 2-celled.

Calyx deeply 5- or 4-lobed . . . . . 34. LEPIDAGATHIS.  
Calyx campanulate, 5-toothed . . . . . 35. PHIALACANTHUS.

\*\* *Stamens* 2, *anthers* 1-celled.

Bracts small, narrow. *Corolla* small . . . . . 36. MONOTHECIUM.  
Bracts small, narrow. *Corolla* long . . . . . 37. CLINACANTHUS.  
Bracts larger than the calyx-segments . . . . . 49. HYPÆSTES.

\*\*\* *Stamens* 2, *anthers* 2-celled.

† *Placentæ* rising elastically from the base of the capsule.

Bracts in 1-sided spikes . . . . . 46. RUNGIA.  
Bracts clustered, shortly peduncled . . . . . 47. DICLIPTERA.



† *Placentæ not rising elastically from the base of the capsule.*

¶ *Anther-cells placed one much higher than the other.*

Anther-cells muticous, bracts in opposite pairs, valvate . . . . .	48. PERISTROPHE.
Anther-cells minutely spurred at base . . . . .	38. JUSTICIA.
Anther-cells apiculate, scarcely spurred at base . . . . .	39. ADHATODA.
Anthers muticous. Flowers clustered. Corolla long . . . . .	40. RHINACANTHUS.
Anthers muticous. Flowers thyrsoid. Corolla not large . . . . .	41. DIANTHERA.

¶¶ *Anther-cells parallel, subequal.*

Bracts small, narrow. Corolla small . . . . .	42. PTYSIGLOTTIS.
Corolla-tube ovoid, constricted in the throat . . . . .	43. SPHINCTACANTHUS.
Bracts large, imbricate. Corolla-tube narrow, long . . . . .	44. ECBOLIUM.
Bracts small. Corolla-tube elongate . . . . .	45. GRAPTOPHYLLUM.

### I. **THUNBERGIA**, Linn. f.

Scandent. *Leaves* often cordate, hastate or angular. *Flowers* axillary, 1-2-nate, or racemose; bracts at the base of the pedicels leaf-like; bracteoles large, margins coherent at least when young. *Calyx* small, annular, 10-16-toothed, or obscure. *Corolla* conspicuous; tube ventricose, curved; limb oblique; lobes 5, rounded, twisted to the left in bud. *Stamens* 4, didynamous near the base of the corolla-tube; anthers 2-celled, cells parallel, oblique, spurred or not at the base. *Disc* cushion-shaped or annular. *Style* long; stigma funnel-shaped, 2-lobed or subentire, or style 2-fid with capitate stigmas; ovules 2 in each cell, collateral. *Capsule* globose, suddenly narrowed into a barren sword-shaped beak. *Seeds* 2 in each cell, ovoid or dorsally compressed, not hairy, base plane or excavate, funicle minute or conic.—Species 30, in Africa, Asia, and N. Australia.

Sect. 1. **Euthunbergia**. *Flowers* axillary. *Calyx* 10-16-toothed. *Seeds* ovoid, base excavate.

1. **T. fragrans**, Roxb. *Cor. Pl.* i. 47, t. 67, and *Fl. Ind.* iii. 33; leaves ovate or oblong acute, calyx-teeth in flower lanceolate hardly longer than the tube, capsule glabrous. *Lamk. Ill.* t. 549, fig. 2; *Wall. Cat.* 767, type sheet; *Nees in Wall. Pl. As. Rar.* iii. 77, 78, and in *DC. Prodr.* xi. 57; *T. Anders. in Journ. Linn. Soc.* ix. 448; *Kurz For. Fl.* ii. 240. *T. javanica*, *Gaertn. f. Fruct.* iii. 22, t. 183; *Blume Bijl.* 806; *Nees in DC. l. c.* 56. *T. scandens*, *Pers. Syn.* ii. 179. *T. volubilis*, *Pers. Syn.* ii. 179; *Nees in DC. l. c.* 59. *T. angustifolia*, *Ham.*; *Nees in Wall. Pl. As. Rar.* iii. 78, and in *DC. l. c.* 56. *T. Roxburghia*, *Nees in Wall. Pl. As. Rar.* iii. 78, and in *DC. l. c.* 58. *T. subsagittata*, *Blanco Fl. Fil.* 518. *T. arnhemica*, *F. Muell. Fragm. Phyt. Austral.* ix. 73.

Throughout INDIA, alt. 1-4000 ft., from the Himalaya Terai to CEYLON and Tenasserim; ascending to 5-7000 ft.—DISTRIB. Malaya to the Philippines and N. Australia.

*Stem* slender, retrorsely hairy or glabrate. *Leaves* 2-3 by  $\frac{1}{2}$ -1 $\frac{1}{2}$  in., obtuse, base cordate or hastate, toothed, mature glabrate; petiole  $\frac{1}{2}$ -1 $\frac{1}{2}$  in. *Pedicels* 1-3 in., 1 rarely 2 in each axil; bracteoles  $\frac{3}{4}$  in., broadly falcate-oblong, subacute. *Calyx* in flower  $\frac{1}{8}$  in., divided half-way down into 12-16 teeth, nearly glabrous, in fruit  $\frac{1}{2}$  in. *Corolla* 1 $\frac{1}{4}$  in., pure white, fragrant. *Anther-cells* elliptic, acute, base unappendaged. *Ovary* glabrous; style funnel-shaped, 2-lipped. *Capsule*  $\frac{3}{4}$ -1 in., glabrous, shining. *Seeds*  $\frac{1}{8}$ - $\frac{1}{5}$  in., rugose.—The typical *T. fragrans* of the Bengal Terai is considered by T. Anderson, from the pure white of its fragrant flowers, the most charming of Bengal



plants. According to him (in *Thwaites Enum.* 234) the plant is not fragrant in Ceylon; but this may apply to *Var. vestita*.

VAR. *lævis*; glabrous or grey puberulous, pedicels often 2 in each axil much thickened upwards in fruit, corolla not fragrant, tube often greenish, capsules grey puberulous. *T. lævis*, *Nees in Wall. Pl. As. Rar.* iii. 77, and in *DC. Prodr.* xi. 56. *T. fragrans*, *Bot. Mag.* t. 1881; *Dalz. & Gibs. Bomb. Fl.* 183. *T. longiflora*, *Benth. in Pl. Hohenack.* 384. *Meyenia longiflora*, *Benth.; Hohenack. in Flora*, 1849, 558.—Deccan Peninsula, extending to Behar and W. Bengal.

VAR. *vestita*, *Nees in Wall. Pl. As. Rar.* iii. 78, and in *DC. Prodr.* xi. 57; stem and leaves more hairy, capsule pubescent.—S. Deccan Peninsula and Ceylon.

VAR. *heterophylla*; leaves subentire lower suborbicular upper narrow-elliptic acute uppermost lanceolate sometimes almost linear. *T. heterophylla*, *Wall. Cat.* 771.—Prome Hills and Ava; *Wallich*.—Possibly a distinct species, but the material is fragmentary; the calyx is 12-toothed, and the pedicel solitary axillary, so that it is hence near *T. fragrans*.

2. **T. tomentosa**, *Wall.; Nees in Wall. Pl. As. Rar.* iii. 78, and in *DC. Prodr.* xi. 58; leaves ovate or oblong acute, calyx-teeth in flower filiform much longer than the tube hairy, capsule villous. *T. Anders. in Journ. Linn. Soc.* ix. 449. *T. fragrans*, *Wall. Cat.* 767, partly.

NILGHERRIES, alt. 6500 ft.; *Wight, Sir F. Adam, Hohenacker, &c.*

*Calyx-teeth* in flower often  $\frac{1}{4}$  in. *Bracts* 1 in., ovate, acute. *Corolla* pure white, tube  $1\frac{1}{2}$  in., mouth 2 in. diam. *Ovary* densely shortly villous. *Capsule*  $1-1\frac{1}{3}$  in.—Closely allied to *T. fragrans*, differing by the filiform calyx-teeth and large villous capsule. The thickening of the peduncles upwards in fruit, insisted on by T. Anderson, is more prominent in *T. fragrans* var. *lævis*.

\*3. *T. ALATA*; *Bojer; Hook. Exot. Fl.* t. 177; softly villous, leaves ovate-cordate, petiole often winged, corolla orange-yellow with a brown or claret eye. *Wall. Cat.* 7141; *Bot. Mag.* t. 2591; *Dalz. & Gibs. Bomb. Fl. Suppl.* 71; *Nees in Wall. Pl. As. Rar.* iii. 78, and in *DC. Prodr.* xi. 58; *T. Anders. in Journ. Linn. Soc.* ix. 449; *Kurz For. Fl.* ii. 240.

INDIA, widely cultivated; naturalized in lower Assam and N.E. Bengal.—DISTRIB. Native of Africa.

Closely allied to *T. fragrans*, and often confounded with it. It is certainly African, and only introduced in India.

Sect. 2. **Meyenia**. *Flowers* axillary, rarely imperfectly racemed. *Calyx* an entire or scarcely toothed ring. *Seeds* ovoid, base excavate.

4. **T. Hawtayneana**, *Wall. Tent. Fl. Nep.* 49, in note, and *Cat.* 769, and *Pl. As. Rar.* ii. 52, t. 164; nearly glabrous, leaves sessile cordate-elliptic or -ovate-acute entire, pedicels short, corolla purple. *T. Hawtaynii*, *T. Anders. in Journ. Linn. Soc.* ix. 448. *Meyenia Hawtayniana*, *Nees in Wall. Pl. As. Rar.* iii. 78, and in *DC. Prodr.* xi. 60; *Wight Ill.* t. 164 b, fig. 1, and  *Ic.* t. 1487.

Hills of the S. DECCAN PENINSULA; Canara, Bellary, Dharwar, Mangalore, Nilgherries, Kurg; *Wight, &c.*—CEYLON; *Walker*.

*Stem* slender. *Leaves* 3 by  $1\frac{1}{4}$  in. *Pedicels*  $\frac{1}{4}-1\frac{1}{4}$  in., solitary, a tuft of hair at their base; bracteoles  $\frac{3}{4}-1$  in., ovate-oblong, nerved. *Corolla*  $1\frac{1}{2}$  in., nearly glabrous, violet-purple, tube yellowish. *Filaments* with shortly stalked glands continued to the connective; anther-cells of the shorter stamens parallel, subsimilar, unappendaged; of the longer divergent, the upper oblique cell shortly mucronate at the base. *Stigma* funnel-shaped; lobes 2, oblong. *Capsule*  $1-1\frac{1}{4}$  in., glabrous; seeds (ex Wallich) semiglobose.—In one example of Wight's, the flowers are on axillary branches 2-4 in. long, the floral leaves are reduced by degrees down to  $\frac{1}{2}$  in. long, i. e. to "bracts," and the inflorescence becomes a raceme.



5. ***T. lutea***, *T. Anders. in Journ. Linn. Soc.* ix. 448; leaves ovate acuminate or lanceolate toothed, pedicels longer than the petioles, corolla yellow or greenish-white.

SIKKIM, alt. 4–7000 ft., frequent; *J. D. H.*, &c.

Pubescent or nearly glabrous. *Stem* slender. *Leaves* 6 by 4 in. or (especially upper ones) on the same stem 4 by  $\frac{2}{3}$  in., wide or cuneate, decurrent at the base, feather-nerved; petiole 1–2 in. *Pedicels*  $1\frac{1}{2}$ –4 in., solitary, glabrous or pubescent, with a tuft of hairs at the base; bracteoles  $\frac{1}{2}$ – $\frac{2}{3}$  in., broadly ovate or round, herbaceous, connate when young. *Calyx* minute, shorter than the small pedicel within the bracteoles, crenulate. *Corolla*  $1\frac{1}{2}$  in., glabrous, usually a faint yellow, greenish below. *Stamens* 4, subsimilar, fifth rudimentary; filaments hairy [at the base, glandular upwards; anther-cells lanceolate, subpendent, separate below, sparingly hairy, white, cells with a round green ciliate basal appendage. *Style* bifid, branches short, linear, subequal, stigmas subcapitate.

Sect. 3. **Hexacentris**. *Flowers* racemed, or the lower axillary. *Calyx* an entire or obscurely crenulate ring. *Seeds* dorsally compressed, base plane.

6. ***T. grandiflora***, *Roxb. Hort. Beng.* 45, and *Fl. Ind.* iii. 34; leaves ovate or uppermost lanceolate often angular or lobed scabrid or pubescent palmately 5–7-nerved, bracts deciduous lower often petioled leaf-like, corolla blue. *Wall. Cat.* 768, type sheet; *Bot. Mag.* t. 2366; *Bot. Reg.* t. 495; *Nees in Wall. Pl. As. Rar.* iii. 77, and in *DC. Prodr.* xi. 54; *Dalz. & Gibs. Bomb. Fl. Suppl.* 70; *Wight Ic.* t. 872; *T. Anders. in Journ. Linn. Soc.* ix. 447; *Kurz For. Fl.* ii. 240. *T. cordifolia*, *Nees l. c.* 55. *Flemingia grandiflora*, *Rottl. & Willd. in Nov. Act. Nat. Cur.* iv. 1803 (*fide Nees*).

BENGAL, alt. 0–4000 ft.; from Behar and Sikkim to Assam, Muneypoor and Chittagong, frequent.—DISTRIB. N. Burma (cult.? in China, Singapore, Bombay, &c.).

A large climber; uppermost leaves often passing into bracts. *Leaves* 6 by 3 in., acute, base cordate, toothed, often angularly lobed, pubescent, rarely glabrate; petiole 3 in. *Racemes* usually stout, pubescent, angular, somewhat dense-fld., or more slender, elongate, nearly glabrous; upper bracts small, inconspicuous; pedicels  $\frac{1}{2}$ –3 in., opposite or fascicled; bracteoles  $\frac{3}{4}$ – $1\frac{1}{2}$  in., falcate-elliptic, acute, often cohering on one margin. *Calyx* subentire. *Corolla* 2–3 in. long and broad. *Filaments* widened below; anthers subsimilar,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long, bearded; cells parallel with a fine linear basal spur. *Ovary* pubescent or glabrescent; stigma very large, funnel-shaped; lobes 2, rounded. *Capsule* 1–2 in., pubescent or glabrous. *Seeds* flat,  $\frac{1}{3}$  in. diam., sub-trigonal, covered (except the large base) with soft brown scaly plates.—Ordinary forms are easily distinguished by the pubescent angular leaves and pubescent raceme; but some Khasian examples are altogether glabrate with entire elliptic acute leaves; and, except by the leaves being 5–7-nerved rather than 3-nerved at the base, they might be placed with *T. laurifolia*.

VAR.? *axillaris*; leaves cordate-ovate acute glabrate, pedicels axillary 2–3 in. 1-fld., capsule and seeds as of *T. grandiflora*.—Khasia; Theria Ghaut, *Clarke*.—Stems very slender for *T. grandiflora*; corolla noted yellow (but?). Marked by *Kurz* as a new species; but the examples do not show the ends of the branches.

7. ***T. laurifolia***, *Lindl. in Gard. Chron.* 1856, 260; glabrous or innovations puberulous, leaves elliptic or oblong acuminate sinuate or denticulate palmately 3-nerved, bracts deciduous, corolla blue. *Bot. Mag.* t. 4985; *T. Anders. in Journ. Linn. Soc.* ix. 447, *excl. syn. Nees*; *Kurz For. Fl.* ii. 240. *T. grandiflora*, *Wall. Cat.* 768, *partly*. *T. Harrisii*, *Hook. Bot. Mag.* t. 4998.

MALAY PENINSULA, from Arracan to Malacca; *Wallich, Griffith, &c.* ANDAMANS; *Kurz*.



Resembling altogether *T. grandiflora*, but leaves narrower. *Seeds* very rugose, hardly scaly.—T. Anderson refers here “partly” *Hexacentris acuminata*, Nees, which is founded on *Wall. Cat.* 7140, collected in Silhet or Khasia, and described as having the leaves distinctly 5-nerved.

8. **T. coccinea**, *Wall. Tent. Fl. Nep.* 49, 58, t. 37, and *Cat.* 766; nearly glabrous, leaves elliptic acuminate toothed palmately 3–5-nerved, racemes elongate pendent, bracts subpersistent lower subsessile lanceolate, corolla red. *Don Prodr.* 120; *Hook. Exot. Fl.* t. 195; *Bot. Mag.* t. 5124; *T. Anders. in Journ. Linn. Soc.* ix. 448. *T. pendula*, *Hassk. Cat. Hort. Bogor.* 147. *Hexacentris acuminata*, Nees; *Wall. Cat.* 7140. *H. coccinea*, *dentata & acuminata*, Nees in *Wall. Pl. As. Rar.* iii. 78, and in *DC. Prodr.* xi. 61.

HIMALAYA, alt. 2–7000 ft., from Kumaon to Bhotan, frequent; *Wallich, &c.* ASSAM; *Griffith.* KHASIA MTS., alt. 1–4000 ft., frequent; *H. f. & T., &c.* TENASERIM; *Beddome.*—(Ceylon, &c., cultivated.)

A large climber; pendent branches often 10–25 ft., terminated by racemes. *Leaves* 5–8 in., lower ovate, upper oblong, obtuse cordate or angular at the base; petiole  $\frac{1}{2}$ –2 in., or of the uppermost leaves 0. *Racemes* 6–18 in., lax, pendent; bracts  $\frac{1}{2}$ –1 in.; pedicels  $\frac{1}{4}$ – $1\frac{1}{2}$  in., opposite or fascicled; bracteoles  $\frac{1}{2}$ –1 in., broadly oblong or ovate, subacute, often coherent on one side, blackish or purple. *Calyx* a minute rim. *Corolla-tube* 1 in., lobes  $\frac{3}{4}$  in. round, from red to orange-rose. *Filaments* glabrous, linear, a tuft of hairs at the base; anther-cells parallel; anthers of the longer filaments have 1 cell long-spurred at base, 1 short-spurred or spurless; anthers of the shorter filaments muticous or with 1 cell shortly spurred. *Style-arms* linear; stigmas subcapitate. *Capsule* 1– $1\frac{1}{2}$  in., minutely pubescent or nearly glabrous. *Seeds* nearly  $\frac{1}{3}$  in. diam., subhemispheric (or at least thicker than those of *T. grandiflora*), rugose not scaly; base plane.—Nees’ description is very erroneous.

9. **T. mysorensis**, *T. Anders. in Journ. Linn. Soc.* ix. 448; nearly glabrous, leaves elliptic acuminate toothed palmately 3-nerved, racemes elongate pendent, bracts small deciduous, corolla yellow. *Hexacentris mysorensis*, *Wight Ic.* t. 871; *Bot. Mag.* t. 4786; *Dalz. & Gibs. Bomb. Fl.* 183.

NILGHERRIES and MYSORE; *Wight, &c.*

An extensive climber; branches pendent. *Leaves* 6 by 1– $3\frac{1}{2}$  in., base cuneate or rounded, strongly 3-nerved, a slender outer pair of nerves sometimes added; petiole  $\frac{1}{4}$ – $1\frac{1}{2}$  in. *Racemes* elongate, lax, long- or short-peduncled; bracts  $\frac{1}{8}$ – $\frac{1}{2}$  in., linear-lanceolate, inconspicuous; pedicels  $\frac{1}{4}$ – $1\frac{1}{2}$  in.; bracteoles 1 in., falcate-elliptic, subacute, often coherent on one side, purplish-green. *Corolla*  $1\frac{1}{2}$  in., mouth 2 in. diam.; tube purplish, limb yellow; in cultivation sometimes with a red border (*Pact. Fl. Gard.* iii. t. 88). *Anthers* subsimilar; cells parallel, hairy, all spurred at base. *Stigma* funnel-shaped, margin somewhat 2-lipped. *Capsule*  $1\frac{1}{4}$  in., glabrous. *Seeds*  $\frac{1}{4}$  in. diam., rugose.

10. **T. Wightiana**, *T. Anders. in Journ. Linn. Soc.* ix. 448; nearly glabrous, leaves ovate acuminate toothed palmately 3–5-nerved, bracts inconspicuous, bracteoles large cordate-orbicular nerved, corolla light blue. *Schmidia bicolor*, *Wight Ic.* t. 1848.

NILGHERRIES; Sisparah, *Wight, Beddome.*

An extensive climber. *Leaves* 5 by  $3\frac{1}{2}$  in., base rhomboid or rounded; petiole 1–2 in. *Racemes* axillary or from nodes of the old wood, 6–12 in.; bracts  $\frac{1}{8}$ – $\frac{1}{2}$  in., linear-lanceolate, deciduous; pedicels opposite, 1 in., 2-ranked, curved; bracteoles 1 by  $1\frac{1}{4}$  in., obtuse with a mucro, purple and cream-coloured (*Wight*). *Corolla*  $1\frac{1}{2}$ – $1\frac{3}{4}$  in., somewhat narrowly tubular, mouth  $1\frac{1}{4}$  in. diam. *Anthers* subsimilar; cells parallel, glabrous, spurred at the base. *Ovary* and style glabrous; stigma funnel-shaped, hardly 2-lobed. *Fruit* not seen.



II. **ELYTRARIA**, *Vahl*.

Herbs, nearly stemless. *Leaves* alternate, crowded, subradical. *Scapes* covered by imbricated bracts; spikes close, rigid, simple or divided; bracts spirally imbricate, not opposite; bracteoles smaller than the bracts. *Calyx* sub-4-partite, segments unequal, the largest sometimes 2-fid. *Corolla* small, white or blueish; tube linear, limb 2-lipped; lobes 5, oblong, imbricate in bud. *Stamens* 2 perfect, attached in the corolla-throat; anthers elliptic, acute; cells 2, parallel, with or without a minute spur at the base. *Style* shortly 2-lobed; ovules 6–10 in each cell, superimposed. *Capsule* ellipsoid, acute. *Seeds* minute, ovoid, reticulated, minutely papillose, attached at a minute point without retinacula.—Species 3–4, American, whereof 1 is widely spread in tropical Africa and Asia.

**E. crenata**, *Vahl Enum.* i. 106; leaves obovate or elliptic obtuse crenate, bracts elliptic acuminate to a single sharp point. *Wall. Cat.* 2420; *Nees in Wall. Pl. As. Rar.* iii. 79, and in *DC. Prodr.* xi. 63; *T. Anders. in Journ. Linn. Soc.* ix. 449; *Dalz. & Gibs. Bomb. Fl.* 183. *E. lyrata*, *Vahl l. c.* *E. virgata*, *Vahl l. c.*; *Nees in DC. Prodr.* xi. 63. *E. marginata*, *Beauv. Fl. Owar.* ii. 58, t. 93; *Nees in DC. l. c.* 63. *E. indica*, *Pers. Syn.* i. 23. *E. Vahlia*, *Michx. Fl. Bor. Am.* i. 9, t. 1. *Justicia acaulis*, *Linn. f. Suppl.* 84; *Roxb. Cor. Pl.* ii. 15, t. 127, and *Fl. Ind.* i. 119.

DECCAN PENINSULA and CEYLON, common southwards; extending north to Delhi, and to the E. Himalaya, *Griffith*.—DISTRIB. Tropical and S. Africa; tropical and N. America.

*Stem* 0–2 in., woolly. *Leaves* 2–5 in., sometimes obtusely lobed, pubescent at least on the nerves beneath, sessile or narrowed into a petiole. *Scapes* several, 3–10 in., clothed with bract-like scales. *Spikes*  $\frac{1}{2}$ –4 in., harsh, simple or branched; bracts  $\frac{1}{2}$  in., margins scarious, ciliate; bracteoles  $\frac{1}{6}$  in., scarious, ciliate. *Calyx*  $\frac{1}{6}$  in.; segments lanceolate, scarious, ciliate, the broad one entire at the apex. *Corolla*  $\frac{1}{4}$ – $\frac{1}{3}$  in., white or blueish. *Anthers* muticous at the base; rudiments of 2 barren stamens sometimes (at least) present. *Capsule*  $\frac{1}{4}$  in., rigid; valves resilient.—The stem is in African examples sometimes considerably elongate branched, and in American examples the scape is sometimes very tall.

III. **NELSONIA**, *R. Br.*

A diffuse, softly villous herb. *Leaves* opposite, elliptic, entire. *Spikes* ovate or cylindric; bracts ovate, glandular-villous, closely imbricate, alternate or spirally scattered; bracteoles 0. *Sepals* 4, unequal, lanceolate, the larger often bifid. *Corolla* very small, purplish rose or white; tube slender, limb 2-lipped; lobes 5, obtuse, patent. *Stamens* 2, attached above the middle of the tube; anthers 2-celled, subincluded; cells broadly ellipsoid, distinct, more or less divergent, glabrous or ciliate, muticous or minutely spurred. *Stigma* very shortly 2-lobed; ovules in each cell 8–10. *Capsule* oblong, acute, bearing seeds from the base, barren upwards. *Seeds* small, roundly ellipsoid, smooth with granular marks, attached on minute points without retinacula.

**N. campestris**, *Br. Prod.* 481; *Endl. Iconogr.* t. 79; *Benth. Fl. Austral.* iv. 543. *N. tomentosa*, *Nees in Wall. Pl. As. Rar.* iii. 79, and in *DC. Prodr.* xi. 65; *Griff. Notul.* iv. 132; *Dalz. & Gibs. Bomb. Fl.* 183; *T. Anders. in Journ. Linn. Soc.* ix. 450. *N. organoides*, *Roem. & Sch. Syst.* i. 173. *N. lamiifolia*, *Spreng. Syst.* i. 42. *N. canescens*, *Nees in DC. l. c.* 67.



*N. villosa*, *senegalensis* & *Smithii*, *Oersted in Vidensk Meddel. Kjobenh.* (1854) iv. 117, 118, t. 4, fig. 3-18. *Justicia canescens* & *brunelloides*, *Lamk. Ill.* i. 40, 41. *J. hirsuta*, *Vahl Enum.* i. 122. *J. lamifolia*, *Koen.*; *Roxb. Fl. Ind.* i. 134. *J. tomentosa*, *Wall. Cat.* 2370. (Other American, African and Australian synonyms omitted.)

Throughout INDIA, alt. 0-4000 ft., from the Himalaya to Ceylon and Malacca, common: not in western desert India.—DISTRIB. S.E. Asia, Australia, Africa, America.

*Stems* mostly short, with petioled leaves often 4-8 in. long; flowering stems trailing, 1-3 ft., with subsessile leaves  $\frac{1}{2}$ -2 in. *Spikes*  $\frac{1}{2}$ -2 in., mostly sessile, terminal on lateral branches; bracts  $\frac{1}{6}$ - $\frac{1}{4}$  in., obtuse, herbaceous. *Calyx*  $\frac{1}{8}$  in., green, striate, hairy or subscarios. *Corolla*  $\frac{1}{6}$  in. *Ovary* and style glabrous. *Capsule*  $\frac{1}{6}$ - $\frac{1}{3}$  in., 8-12-seeded. *Seeds* yellowish with brown granulations.—The picture of the seed by Kippist in *Trans. Linn. Soc.* xix. t. 6, fig. 11, showing the surface with hammer-headed spines, is erroneous.

*VAR. vestita*; suberect, hairy, leaves very large, corolla-lobes acute. *N. vestita*, *Roem. & Sch. Syst.* i. *Mant.* 145. *Justicia tomentosa*, *Roxb. Hort. Beng.* 4, and *Fl. Ind.* i. 131. *J. bengalensis*, *Spreng. Syst.* i. 82. *Dianthera tomentosa*, *Roxb. Ic. Ined. in Herb. Kew.*—Pegu; *M'Lelland*, *Brandis*, &c.—Cauline leaves attaining 10 in., uppermost 3-5 in.; petiole 2 in. *Bracts* elliptic, acute.—Dr. King says that it is very easy to distinguish this from every form of *N. campestris*, but that he can give no good character for it, and that it had better be regarded as an extreme form of that plant. Roxburgh says the capsule is 4- or 8-seeded; it is really as that of *N. campestris* type.

#### IV. **EBERMAIERA**, Nees.

Herbs or small undershrubs. *Leaves* opposite (in *E. glauca* alternate), entire or nearly so. *Spikes* or *racemes* terminal or quasi-axillary, simple or compound, dense or lax; bract at the base of the pedicel leaf-like or overtopping the flower or small inconspicuous; bracteoles 2 near the base of the calyx, smaller than the bract. *Sepals* 5, oblong or linear, subequal or one larger. *Corolla-tube* elongate, cylindric (in *E. coriacea* & *parviflora* short-funnel-shaped); lobes 5, short, patent. *Stamens* 4, didynamous, included in the corolla-tube (in *E. coriacea* & *parviflora* shortly exsert); filaments patently hairy (in *E. parviflora* glabrous); anther-cells 2, ovoid, separate, muticous. *Disc* inconspicuous. *Ovary* glabrous or nearly so; style linear glabrous; lobes 2, oblong, the lower frequently again 2-lobed; ovules very many. *Capsule* small, oblong, bearing seeds from the base to near the apex. *Seeds* 15-30 in each cell, small, globose or cuboid; hilum a minute hollow; retinacula 0; unripe glandular, ultimately nearly smooth or with obscure shallow pits; albumen thin, cartilaginous (Benth.).—Species 40, in S.E. Asia, Malaya, Australia, and Brazil.

\* *Flowers sessile or subsessile, spikes elongate or capitate rarely divided, sepals  $\frac{1}{4}$  in. or more one often distinctly larger than the others.*

1. ***E. glauca***, Nees in *DC. Prodr.* xi. 73; stem patently viscous-pubescent upwards, leaves petioled spathulate-oblong upper alternate, spikes elongate lax interrupted below, lower bracts petioled linear-spathulate much exceeding the flowers, corolla  $\frac{1}{4}$ - $\frac{1}{3}$  in. *Wall. Cat.* 9083; *Wight Ill.* t. 164 b, fig. 2, and *Ic.* t. 1488; *Dalz. & Gibs. Bomb. Fl.* 184; *T. Anders. in Journ. Linn. Soc.* ix. 450, in some part and excl. syn. *E. ligulata*, *Bedd. Ic. Pl. Ind. Or.* t. 245.

W. DECCAN PENINSULA and S. MADRAS, frequent; *Wight*, &c. BENGAL; Darjeeling Terai, *Clarke*. TENASSERIM; *Beddome*.

*Stems* 12-15 in.; lower leaves and branches opposite or leaves nearly all alternate.



*Leaves* 2 by  $\frac{2}{3}$  in., obtuse, base attenuate, slightly viscous-pubescent or glabrate, entire or sinuate; petiole  $\frac{1}{4}$  in. *Spikes* 2–6 in.; lowest bracts altogether leaf-like (whence T. Anderson says “flowers solitary axillary”); tip of the spike often dense with short bracts resembling the spike of neighbouring species; bracteoles linear, obtuse, shorter than the calyx. *Sepals* 4 subsimilar,  $\frac{1}{4}$  in., linear-subulate, sparsely glandular-hairy; the fifth longer, much broader, linear-oblong, obtuse. *Corolla* straight, slightly pubescent without, purplish with rose or yellow stripes. *Anther-cells* muticous or minutely mucronate at base. *Capsule*  $\frac{1}{3}$  in.—Described from Nees’ type specimen; Wight’s figure is taken from a form having a much denser more glandular-pubescent spike. The Australian species referred here by T. Anderson and Bentham differs in its hairy ovary and capsule, and many other minute points; but it might be better to unite it, and make a wholesale reduction of species here.

**VAR. *spatulata***; leaves very spatulate, spikes denser only a few of the lowest elongate, calyx and bracteoles very glandular-hairy, corolla scarcely  $\frac{1}{4}$  in. *Adenosma spatulatum*, *Blume Bijl.* 757. *Ebermaiera spatulata*, *Hassk.*; *Nees in DC. Prodr.* xi. 74, partly?—Pegu; *Kurz.* Tenasserim; *Beddome.* Bengal; Pubna, *Clarke.*—Distrib. Java.—Growing in rice-swamps; stems erect, thick, quadrangular or striate; many or nearly all the leaves alternate.—*Ebermaiera spatulata*, Nees, is described from a Philippine plant of Cuming’s, which widely differs from Kurz’s Pegu specimens.

2. ***E. polybotrya***, *Nees in DC. Prodr.* xi. 74; stems erect adpressedly grey-pubescent upwards, leaves elliptic subobtuse at both ends, spikes cylindric not lax downwards, bracts narrowly oblong scarcely exceeding the calyx, corolla  $\frac{1}{4}$  in.

BENGAL; frequent in Terai swamps in Sikkim and Silhet, *J. D. H.*, &c. MOULMEIN and MERGUI; *Griffith.*

*Stems* 6–8 in., often branched from the base. *Leaves* all opposite, even at the base of the spike,  $1\frac{1}{4}$  by  $\frac{1}{3}$  in., subentire, minutely pubescent on the nerves beneath or glabrous; petiole 0 or in the lower leaves scarcely  $\frac{1}{8}$  in. *Spikes*  $1\frac{1}{4}$  in.; bracts  $\frac{1}{4}$ – $\frac{1}{3}$  in.; bracteoles linear, shorter than the calyx. *Sepals* 4 subsimilar, narrow-linear, subobtuse; the fifth rather longer, much broader, oblong, obtuse. *Corolla*, *stamens*, and *capsule* nearly as of *E. glauca*.

3. ***E. humilis***, *Nees in Wall. Pl. As. Rar.* iii. 80, and in *DC. Prodr.* xi. 74; stem erect branched adpressed white-pubescent upwards, leaves opposite subsessile narrowly elliptic, heads terminal small globose, bracts oblong sessile hardly so long as the calyx, corolla  $\frac{1}{3}$  in. and upwards. *Wall. Cat.* 7148; *T. Anders. in Journ. Linn. Soc.* ix. 450.

BURMA; Prome Hills, *Wallich.*

*Stem* 6–8 in., branched from near the base; branches ascending, shorter than the central stem. *Leaves*  $1\frac{1}{4}$  by  $\frac{1}{2}$  in., obtusely rhomboid at both ends, nearly glabrous, adpressedly white-pubescent on the nerves beneath; petiole hardly  $\frac{1}{12}$  in. diam. *Heads* sessile,  $\frac{1}{2}$ – $\frac{3}{4}$  in. diam.; bracts and bracteoles  $\frac{1}{4}$  in. *Sepals*, 4 linear, subobtuse; the fifth slightly larger, oblong obtuse.—Nearly allied to *E. polybotrya*, but the heads are not elongate cylindric, the bracteoles and sepals are less acute, the corolla is larger.

4. ***E. glutinosa***, *Wall. Cat.* 9087; stem trailing rooting pubescent, leaves elliptic, base attenuate, heads subspherical on short branches and quasi-axillary, bracts elliptic sessile hardly so long as the calyx, corolla  $\frac{1}{2}$  in. *Ebermaiera* sp., *Wall. Cat.* 9085. *E. glauca*, *T. Anders. in Journ. Linn. Soc.* ix. 450, in great part.

CENTRAL INDIA, N.W. PROVINCES, and BENGAL, frequent; Moradabad, *Thomson*; Behar, *J. D. H.*; Bundelcund, *Edgeworth*; Silhet, *Wallich*, &c.

*Stems* numerous, 12–18 in.; nodes in the trailing branches distant. *Leaves* all (or nearly all) opposite,  $1\frac{1}{2}$  by  $\frac{2}{3}$  in., subobtuse, entire, minutely pubescent or glabrous;



petiole 0— $\frac{1}{4}$  in. *Heads* 2–8-fl.; bracts  $\frac{1}{4}$  in.; bracteoles  $\frac{1}{4}$  in., narrowly obovate-oblong. *Sepals* 4, linear, subobtusely, viscidly pubescent; the fifth slightly longer, oblong, obtuse. *Corolla* blueish with dark veins. *Ovary* minutely pubescent upwards; one stigma-lobe oblong, the other bifid.—Easily separated from *E. glauca* by its habit, opposite leaves and large flowers.

5. ***E. zeylanica***, *Nees in DC. Prodr.* xi. 74; trailing branches pubescent, leaves elliptic subobtusely narrowed at the base, spikes cylindric, bracts obovate slightly longer than the flowers, corolla  $\frac{1}{4}$ — $\frac{1}{3}$  in. *T. Anders. in Journ. Linn. Soc.* ix. 451, *excl. syn.* *E. glauca*, *T. Anders. in Thwaites Enum.* 224, *not in Nees.* *Erythracanthus elongatus*, *Dalzell & Gibbs. Bomb. Fl.* 184, *not of Nees.*

W. DECCAN PENINSULA and CEYLON; Concan, *Dalzell, Stocks, &c.* CEYLON; *Macrae, Thwaites.*

*Stem* erect, short, with large leaves, and flowering runners with much smaller leaves. *Leaves* 3 by 1 in., subentire, sparsely hairy on both surfaces, or glabrate with nerves beneath pubescent; petiole  $\frac{1}{2}$  in., or in the leaves of the lateral branches 0. *Spikes* 1–2 in., dense; bracts  $\frac{1}{3}$  by  $\frac{1}{8}$  in., obtuse, apiculate, strongly 1-nerved; bracteoles  $\frac{1}{3}$  in., linear-spathulate. *Sepals* 4, linear, rather shorter than the bracts; the fifth rather broader, linear, subacute. *Corolla*, stamens, and capsule nearly as of *E. glauca*.

6. ***E. thyrsoides***, *Nees in Wall. Pl. As. Rar.* iii. 80, and in *DC. Prodr.* xi. 75; stem erect hairy, leaves petioled elliptic-spathulate subobtusely, spikes cylindric thyrsoid, bracts oblong very acute scarcely longer than the flowers, corolla  $\frac{1}{3}$  in. *Wall. Cat.* 7149. *E. zeylanica*, *T. Anders. in Journ. Linn. Soc.* ix. 451, *partly.* *E. diffusa*, *Kurz in Journ. As. Soc.* 1871, pt. ii. 74. *Capraria diffusa*, *Roxb. Fl. Ind.* iii. 93, *fide Kurz.*

EAST FRONTIER from Cachar, *Keenan*, to Tenasserim, *Beddome*; plentiful in Chittagong, *J. D. H., &c.*

*Stem* 8–18 in., decumbent at the very base, then erect, longer than the ascending branches. *Leaves* 3 by  $\frac{3}{4}$  in., hairy. *Spikes* axillary and terminal 1–4 in.; pedicels of the lower flowers  $\frac{1}{10}$ — $\frac{1}{5}$  in.; bracteoles with fine hairs often  $\frac{1}{6}$ — $\frac{1}{4}$  in. long. *Sepals* 4, subsimilar, linear, with fine long hairs; the fifth longer, narrowly lanceolate, twice as broad. *Corolla* (at least often) white or very nearly so. Otherwise as *E. zeylanica*, with which T. Anderson united this species; but it appears amply distinct.

7. ***E. incana***, *Hassk. Hort. Bogor.* 147; stem short suberect scarcely branched, leaves petioled elliptic shortly softly hairy on both surfaces, spikes cylindric, bracts lanceolate shorter than the calyx not aristate, corolla  $\frac{1}{2}$  in. *E. velutina*, *Nees in DC. Prodr.* xi. 76; *T. Anders. in Journ. Linn. Soc.* ix. 452.

MERGUI; *Griffith.* TENASSERIM (or Andamans), *Helper* (*Kew Distrib.* ii. 6080). —DISTRIB. Java?

*Stem* decumbent, base almost woody, then erect, 3–4 in., closely rusty-villous. *Leaves* 4 by 1½ in., obtuse, base narrowed, subentire; petiole  $\frac{1}{4}$ –1 in. *Spikes* 1–1½ in., dense; bracts  $\frac{1}{4}$  in.; bracteoles  $\frac{1}{6}$  in., broadly lanceolate, closely softly hairy. *Sepals*, two  $\frac{1}{6}$  in. linear, two nearly  $\frac{1}{3}$  in. linear, one  $\frac{1}{3}$  in. lanceolate; all slightly pubescent and ciliate. *Corolla* and stamens nearly as in *E. glutinosa*. *Capsule*  $\frac{1}{4}$  in.—*Nees* says that this is nearly the same as *E. incana*, *Hassk.*, of which I have seen no specimen; and *Kurz* says (*Journ. As. Soc.* 1870, pt. ii. 78) that it is quite the same. By habit, bracts and indumentum it approaches *E. macrophylla*, *T. Anders.*

8. ***E. lanceolata***, *Hassk. Hort. Bogor.* 147; stems short branched suberect, leaves oblong or narrowly elliptic cuneate at both ends glabrate or minutely pubescent beneath, spikes cylindric dense, bracts oblong acute



pubescent hardly ciliate, calyx ciliate shorter than the bract, corolla  $\frac{1}{2}$  in. and upwards. *Nees in DC. Prodr.* xi. 76; *Kurz in Journ. As. Soc.* 1870, pt. ii. 78. *E. argentea*, *Nees l. c.*; *T. Anders. in Journ. Linn. Soc.* ix. 451. *Adenosma lanceolatum*, *Blume Bijd.* 757. *Staurogyne*, *Wall. Cat.* 7489.

PENANG; *Wallich*. MALACCA; *Griffith*. TENASSERIM (or Andamans), *Helper* (Kew Distrib. n. 6077).—DISTRIB. Java.

*Stems* 3–6 in., base almost woody, pubescent. *Leaves* 3 by  $\frac{3}{4}$  in., narrowed to an obtuse apex, entire, sinuate, pubescent on the nerves beneath, and sometimes also slightly on the lamina; petiole  $\frac{1}{4}$ – $\frac{1}{2}$  in. *Spikes* 2 in., dense; bracts  $\frac{2}{3}$  in., not aristate; bracteoles  $\frac{1}{3}$  in., narrow-lanceolate, ciliate. *Sepals* 4,  $\frac{1}{3}$  in., linear; the fifth slightly longer and broader; all prominently ciliate. *Capsule*  $\frac{1}{4}$  in.

9. ***E. Staurogyne***, *Nees in DC. Prodr.* xi. 75; stem decumbent short, leaves narrowly elliptic whitened beneath, spikes short cylindric or capitate, bracts lanceolate 3-nerved long-aristate pubescent not ciliate, corolla  $\frac{2}{3}$  in. *T. Anders. in Journ. Linn. Soc.* ix. 451, *excl. all syn.* *Staurogyne argentea*, *Wall. Pl. As. Rar.* ii. 80, t. 186, and *Cat.* 4905.

KHASIA HILLS up to 3000 ft. alt., and N. SILHET, frequent; *Wallich*, *Griffith*, *H. f. & T.*, &c.

*Stems* 3–8 in., pubescent, prostrate, rooting, base almost woody. *Leaves* 4 by  $1\frac{1}{2}$  in., subobtuse, base rounded or cuneate, entire, glabrous, nerves beneath prominent puberulous; petiole  $\frac{1}{2}$ – $1\frac{1}{2}$  in. *Spikes*  $\frac{1}{2}$ –2 in.; bracts  $\frac{1}{3}$  in. with awns  $\frac{1}{2}$  in.; bracteoles  $\frac{1}{3}$  in., linear, awns  $\frac{1}{3}$  in. *Sepals*  $\frac{1}{3}$  in., linear, awns  $\frac{1}{3}$  in. *Corolla* purple with rose marks. *Style* bifid, lower lobe 2-partite. *Capsule*  $\frac{1}{4}$  in.

10. ***E. angustifolia***, *T. Anders. in Journ. Linn. Soc.* ix. 451, *excl. many syn.*; stem decumbent short, leaves narrowly elliptic somewhat whiter beneath, spikes short cylindric or capitate, bracts lanceolate 3-nerved long-awned pubescent ciliate, awns of the bracteoles and sepals without hairs or cilia. *E. Staurogyne*  $\beta$  *angustifolia*, *Nees in DC. Prodr.* xi. 75. *Staurogyne angustifolia*, *Wall. Cat.* 4906.

CHITTAGONG, alt. 0–1000 ft., frequent; *H. f. & T.*, &c. PEGU; *J. Scott*. MOULMEIN; *Griffith*. RANGOON; *M'Lelland*. TENASSERIM; King's Island, *Helper*.

Very near *E. Staurogyne*; but the long white cilia on the margin of the lanceolate portion of the bracts and bracteoles at flower-time give the heads a different aspect. The characters drawn from the breadth of the leaves and the cuneation of their bases fail; and Mr. Bentham has noted the species as perhaps only a var. of *E. Staurogyne*. *T. Anderson* has variously marked it, *E. Staurogyne*, *setigera*, *angustifolia*, and *aristata*. The awns of the bracteoles and sepals have very minute white adpressed bristles.

11. ***E. setigera***, *Nees in DC. Prodr.* xi. 76; stems short branched, leaves short-petioled narrowly elliptic, spikes capitate, bracts almost linear, bracteoles and sepals subulate hairy nearly to their tip with patent long tawny hairs from bulbous bases, corolla  $\frac{1}{2}$  in. and upwards. *T. Anders. in Journ. Linn. Soc.* ix. 451. *E. trichocephala*, *Miq. Fl. Ind. Bat.* ii. 774.

MALACCA; *Cuming*.—DISTRIB. Sumatra, Borneo.

*Stem* 3–6 in., pubescent. *Leaves* 2 by  $\frac{3}{4}$  in., cuneate, subobtuse at both ends, glabrous above, puberulous whiter beneath; petiole  $\frac{1}{4}$ – $\frac{1}{3}$  in. *Spikes*  $\frac{1}{2}$ –1 in.; bracts  $\frac{1}{2}$ – $\frac{3}{4}$  in., linear, long-attenuate, subulate, scarcely awned, herbaceous not nervose (as in the two preceding species); bracteoles similar, but rather shorter. *Sepals*  $\frac{1}{2}$  in., linear-subulate, hardly aristate. *Capsule*  $\frac{1}{4}$  in.; bracteoles and sepals less stellate in fruit than in *E. angustifolia*.—*E. trichocephala*, *Miq.*, is referred by *Kurz* (*Journ. As. Soc.* 1870, pt. ii. 78) to *E. lanceolata*, and by *T. Anderson* (*Journ. Linn. Soc.*



ix. 451) to *E. Staurogyne*; but from the description and habitat is surely *E. setigera*.

12. ***E. longifolia***, *Nees in DC. Prodr.* xi. 76; leaves long-petioled lanceolate, spikes cylindric softly hairy, lower flowers somewhat pedicelled, bracts narrow-lanceolate attenuate subulate herbaceous hairy below minutely pubescent upwards, corolla  $\frac{1}{2}$ – $\frac{2}{3}$  in. *T. Anders. in Journ. Linn. Soc.* ix. 451.

MALACCA; *Griffith* (Kew Distrib. n. 6079), *Cuming*.

*Branches* 3–8 in., divided, pubescent; innovations white-silky, subtomentose. *Leaves* 5 by  $1\frac{1}{2}$  in., narrowed to both ends, subobtusely, base cuneate, subentire, sinuate, glabrous above, puberulous whiter beneath; petiole  $\frac{1}{2}$ –2 in. *Spikes* 1– $2\frac{1}{2}$  in.; lower pedicels often  $\frac{1}{8}$  in.; bracts  $\frac{2}{3}$  in.; bracteoles similar but rather narrower and shorter. *Sepals*  $\frac{1}{2}$  in., very like the bracteoles. *Capsule*  $\frac{1}{4}$  in., rather broader than in the preceding species.

13. ***E. axillaris***, *Nees in Wall. Pl. As. Rar.* iii. 80, and in *DC. Prodr.* xi. 75; branches almost woody, leaves elliptic narrowed at both ends minutely punctate above, spikes cylindric drooping very hairy, bracts lanceolate acuminate hairy, corolla  $\frac{1}{2}$  in. very hairy without. *T. Anders. in Journ. Linn. Soc.* ix. 452. *Ruellia?* *comosa*, *Wall. Cat.* 2414.

PENANG; *Wallich*.

*Leaves* 6 by  $1\frac{1}{2}$ – $2\frac{3}{4}$  in., subobtusely, base cuneate, nearly entire, glabrous, pubescent on the nerves beneath; petiole  $\frac{1}{4}$ –1 in. *Spikes* 2–4 in., dense, several among the penultimate leaves on the branch; bracts  $\frac{1}{2}$  in., flaccid; pedicels hardly any; bracteoles resembling the bracts, but narrower and rather shorter. *Sepals*  $\frac{1}{3}$  in., linear-lanceolate, acuminate, softly hairy. *Capsule*  $\frac{1}{3}$  in.

\*\* *Lower flowers of the racemes more or less distinctly pedicelled, racemes often panicled, sepals  $\frac{1}{4}$  in. or more not very unequal.*

14. ***E. Simonsii***, *T. Anders. in Journ. Linn. Soc.* ix. 451; leaves large elliptic narrowed at both ends, racemes panicled white-hairy, bracts linear, sepals linear covered to the tips on all sides with glistening white hairs, corolla  $\frac{1}{2}$  in.

KHASIA HILLS; Bor Pani, alt. 2500 ft., *Simons*.

*Stems* 6 in., stout, woody, branched, villous upwards. *Leaves* 8 by  $3\frac{1}{2}$  in., subobtusely, base cuneate, nearly entire, sparsely hairy or finally glabrate above, glabrous, paler beneath, puberulous on the nerves; petiole 1–2 in. *Racemes* dense, sparingly branched or laxly paniculate, 1–4 in.; bracts  $\frac{1}{3}$  in., very narrowly linear, obtuse; pedicels often  $\frac{1}{6}$  in.; bracteoles  $\frac{1}{4}$ – $\frac{1}{3}$  in., narrowly linear. *Sepals* nearly  $\frac{1}{2}$  in., two of them somewhat shorter. *Corolla* nearly glabrous without. *Capsule*  $\frac{1}{4}$  in.

15. ***E. Helfer***, *T. Anders. in Journ. Linn. Soc.* ix. 452, *chiefly*; stem short stout, leaves obovate-oblong closely minutely pubescent on the surface above and the nerves beneath, peduncles bearing 1 or several racemes, bracts petioled elliptic obtuse whitened membranous nearly glabrous, sepals linear obtuse nearly glabrous.

TENASSERIM; Attaran, *Helfer* (Kew Distrib. n. 6075). PEGU; Thoungyun, *Brandis*.

*Stem* 4 in., villous, simple. *Leaves* 9 by 5 in., obtuse, base attenuated, somewhat whitened beneath; petiole  $\frac{1}{2}$ –1 in. *Peduncles* 1–5 from the penultimate axils, 1–3 in., reddish, minutely pubescent. *Racemes* 1–3 in., somewhat dense; bracts  $\frac{1}{2}$  by  $\frac{1}{4}$  in., nervose; pedicels sometimes  $\frac{1}{8}$ – $\frac{1}{6}$  in.; bracteoles  $\frac{1}{3}$  in., narrowly oblong, resembling the bract, upper shorter and narrower. *Sepals* 4,  $\frac{1}{4}$  in., of which 2 rather shorter; the fifth rather longer, twice as broad, 3-nerved. *Corolla*  $\frac{1}{2}$  in., glabrous or nearly so.



*Capsule*  $\frac{1}{4}$  in.—T. Anderson l. c. describes one of the bracts as at the same time 1-nerved and 3-nerved, but he subsequently himself separated in the Herbarium his *E. macrophylla*.

16. ***E. macrophylla***, *T. Anders. in Herb. Kew*; stem hardly any, leaves short-petioled obovate-oblong obtuse minutely closely pubescent on the surface above and on the nerves beneath, peduncle simple or branched, racemes slender pubescent, bracts and bracteoles small spatulate-elliptic herbaceous pubescent. *E. Helferi*, *T. Anders. in Journ. Linn. Soc.* ix. 452, *in part.*—*Ebermaiera*, *Wall. Cat.* 9086.

LOWER BURMA; Chappedong, *Wallich*; Moulmein, *Parish*, *Lobb*.

*Stem* 1–3 in., stout, villous. *Leaves* 7 by 4 in., base broadly rhomboid; petiole  $\frac{1}{8}$ – $\frac{2}{3}$  in. *Peduncles*  $\frac{1}{4}$  in.; spikes 3 in.; bracts  $\frac{1}{4}$ – $\frac{1}{3}$  in.; pedicels  $\frac{1}{10}$  in.; bracteoles  $\frac{1}{3}$ – $\frac{1}{4}$  in., resembling the bracts, unequal. *Sepals*  $\frac{1}{3}$  in., linear, scarcely acute, pubescent. *Corolla*  $\frac{1}{2}$  in., glabrous or nearly so.—Exceedingly near *E. Helferi*, but the bracts and bracteoles are much smaller, not white membranous nervose.

17. ***E. Griffithiana***, *T. Anders. in Journ. Linn. Soc.* ix. 452; stem short, leaves petioled elliptic rounded at both ends minutely closely pubescent above, racemes elongate paniced, bracts elliptic pubescent, sepals  $\frac{1}{3}$ – $\frac{1}{2}$  in. linear. *Erythracanthus Griffithianus*, *Nees in DC. Prodr.* xi. 78. *E. obtusus*, *Wight Ic.* t. 1491, *not of Nees*.

MALACCA; *Griffith* (*Kew Distrib.* n. 6078).

*Stem* 3–6 in., herbaceous, branched, pubescent. *Leaves* 5 by 3 in., pubescent beneath or finally on the nerves only; petiole  $\frac{1}{2}$ – $1\frac{1}{2}$  in. *Peduncles* 1–2 in., reddish; racemes up to 5 in.; bracts  $\frac{1}{2}$  by  $\frac{1}{3}$  in., hardly acute; pedicels 0– $\frac{1}{3}$  in.; bracteoles  $\frac{1}{3}$  by  $\frac{1}{8}$  in., similar to the bracts. *Sepals* subequal, narrowly linear, somewhat striate longitudinally. *Capsule*  $\frac{1}{4}$  in.

18. ***E. elongata***, *Nees in DC. Prodr.* xi. 721; leaves oblong acute at both ends punctate obscurely pubescent above, racemes elongate lax, bracts linear-lanceolate, sepals  $\frac{1}{3}$  in. almost equal sublinear pubescent. *T. Anders. in Journ. Linn. Soc.* ix. 452. *Adenosma elongatum*, *Blume Bijl.* 757. *Erythracanthus elongatus*, *Nees in DC. Prodr.* xi. 78, *excluding Var. β*.

PENANG; *Wallich* (fide T. Anderson).—DISTRIB. Java.

*Stem* 6 in., erect, pubescent. *Leaves* 6 by 2 in., obscurely pubescent beneath, herbaceous, concolorous or nearly so, nerves beneath inconspicuous; petiole 1– $2\frac{3}{4}$  in. *Raceme* 10 in., branched near the base; bracts  $\frac{1}{2}$  by  $\frac{1}{20}$  in., acuminate, scarcely awned; pedicels 0– $\frac{1}{6}$  in.; bracteoles  $\frac{1}{3}$  in., linear. *Corolla*  $\frac{1}{3}$ – $\frac{1}{2}$  in., minutely pubescent without. *Capsule* nearly  $\frac{1}{3}$  in.—The example from Java marked *E. subpaniculata*, Hassk., is *E. elongata*, Nees; but it may perhaps be wrongly named, as the description of Hasskarl (in Retzia, 77) says inter alia that the leaves of *E. subpaniculata* are mostly alternate, much whitened beneath.

19. ***E. lasiobotrys***, *Nees in DC. Prodr.* xi. 721; stem erect sub-tomentose upwards, leaves narrowly elliptic cuneate at both ends glabrate above, racemes elongate very lax, bract filiform very small, sepals  $\frac{1}{4}$  in. linear with patent white hairs to the tips on all sides. *Wall. Cat.* 9084; *T. Anders. in Journ. Linn. Soc.* ix. 452.

LOWER BURMA; Chappedong Hills, *Wallich*; Mergui, *Griffith*; Moulmein, *Falconer*; Tavoy, *Parish*.

*Stem* decumbent, rooting, then 6–15 in. erect. *Leaves*  $5\frac{1}{2}$  by 2 in. (usually smaller), mature glabrous minutely pubescent on the nerves beneath; petiole  $\frac{1}{4}$ – $\frac{3}{4}$  in. *Panicles* 6–12 in., straggling; racemes 2–5 in., lower flowers distant; bracts  $\frac{1}{3}$ – $\frac{1}{6}$  in.;



lower pedicels  $\frac{1}{8}$ – $\frac{1}{6}$  in.; bracteoles  $\frac{1}{10}$  in., filiform. *Sepals* subequal, somewhat larger in fruit. *Corolla*  $\frac{1}{2}$  in., narrow tubular, sparsely minutely hairy. *Capsule*  $\frac{1}{4}$  in.

20. **E. paniculata**, *Wall. mss.*; *T. Anders. in Journ. Linn. Soc.* ix. 453; stem erect subtomentose upwards, leaves narrowly elliptic cuneate at both ends glabrate above, panicle compound, racemes lax, bracts filiform very small, sepals  $\frac{1}{4}$  in. linear nearly glabrous.

MUNEYPOOR; *Hort. Calcutt.* S.E. ASSAM (or Ava), *Griffith* (Kew Distrib. n. 6082).

*Stems* 1 foot, woody, sometimes branched. *Leaves* 7 by 3 in. (often smaller) scarcely acute, prominently reticulated, pubescent on the nerves beneath; petiole  $\frac{1}{4}$ – $\frac{3}{4}$  in. *Panicles* (including peduncles) 6–9 in., reddish, minutely pubescent; bracts  $\frac{1}{8}$ – $\frac{1}{6}$  in., minutely pubescent; pedicels  $\frac{1}{8}$ – $\frac{1}{6}$  in.; bracteoles  $\frac{1}{10}$  in., filiform. *Sepals*  $\frac{1}{6}$  in. in flower,  $\frac{1}{4}$  in. or more in fruit. *Corolla*  $\frac{1}{3}$  in., slender, nearly glabrous. *Capsule*  $\frac{1}{6}$ – $\frac{1}{3}$  in.—Closely allied to *E. lasiobotrys*, but with smaller flowers and fruit, and the panicle without the abundant hair of *E. lasiobotrys*.

VAR. *glabrior*; leaves less reticulated, panicle thin very glabrous, sepals very slender glabrous.—Patkoy Mts., alt. 4000 ft.; *Griffith* (Kew Distrib. n. 6085).

21. **E. obtusa**, *T. Anders. in Journ. Linn. Soc.* ix. 453; stem short subtomentose, leaves elliptic rounded at both ends closely shortly hairy above, panicles compound shortly pubescent, bracts very small filiform, sepals  $\frac{1}{3}$  in. linear minutely pubescent. *Erythracanthus obtusus*, *Nees in DC. Prodr.* xi. 78.

MERGUI; *Griffith* (Kew Distrib. n. 6083). MOULMEIN, *Falconer*.

*Stem* 3–4 in. *Leaves*  $3\frac{1}{2}$  by  $1\frac{1}{2}$  in., very obtuse, base sometimes subcordate, beneath glabrous, the nerves pubescent; petiole  $\frac{1}{4}$ –2 in. *Peduncles* often numerous from the upper axils; panicles 3–5 in., racemes lax; bracts  $\frac{1}{8}$ – $\frac{1}{6}$  in.; lower pedicels  $\frac{1}{8}$ – $\frac{1}{6}$  in.; bracteoles  $\frac{1}{10}$  in., filiform. *Sepals*  $\frac{1}{6}$  in. in flower, in fruit  $\frac{1}{4}$  in. *Corolla*  $\frac{1}{3}$  in., slender, minutely hairy. *Capsule*  $\frac{1}{3}$  in.

22. **E. Maclellandii**, *T. Anders. in Journ. Linn. Soc.* ix. 454; stem erect branched, leaves oblong narrowed at the base obscurely pubescent above, panicles small numerous patently softly hairy lateral and terminal, bracts small oblong herbaceous, sepals  $\frac{1}{3}$  in. linear patently hairy.

PEGU; *M'Leelland*.

*Stems* 6–12 in., herbaceous, pubescent. *Leaves*  $2\frac{1}{2}$  by  $\frac{1}{2}$  in., obtuse, mature nearly glabrous; petiole 0– $\frac{1}{4}$  in. *Panicles* 1–2 in., on short branches beginning near the base of the stems; lower bracts passing gradually into leaves, upper scarcely  $\frac{1}{4}$  in.; pedicels mostly short, some attaining  $\frac{1}{6}$  in.; bracteoles  $\frac{1}{6}$  in., narrowly oblong. *Corolla*  $\frac{1}{4}$ – $\frac{1}{3}$  in.—Allied to *E. glauca* and *E. polybotrya*, but is driven to this position in the linear series by its slender racemes and subequal sepals.

\*\*\* *Racemes elongate, lax, calyx small* ( $\frac{1}{8}$ – $\frac{1}{6}$  in. long).

23. **E. racemosa**, *Miq. Fl. Ind. Bat.* ii. 775; stem erect somewhat stout, leaves narrowly elliptic cuneate at both ends minutely hairy above, racemes long simple or divided, sepals  $\frac{1}{8}$  in. lanceolate minutely pubescent, corolla  $\frac{1}{2}$  in. *T. Anders. in Journ. Linn. Soc.* ix. 452. *Ruellia racemosa*, *Roxb. Fl. Ind.* iii. 42; *Wall. Cat.* 2336. *Erythracanthus racemosus*, *Nees in Wall. Pl. As. Rar.* iii. 80, and in *DC. Prodr.* xi. 78.

MALAY PENINSULA, from Moulmein southwards, and Penang, frequent; *Wallich*, &c.—DISTRIB. Java.

*Stems* attaining 15 in., branched, closely brown-villous. *Leaves*  $4\frac{1}{2}$  by  $1\frac{1}{4}$  in., scarcely acute, reddish brown, glabrous beneath, pubescent on the nerves; petiole  $\frac{1}{2}$ – $1\frac{1}{4}$  in. *Peduncles* 2–3 in., subterminal; racemes 2–5 in., often simple, sometimes divided; bracts  $\frac{1}{8}$ – $\frac{1}{6}$  in., narrowly oblong or linear; pedicels sometimes  $\frac{1}{8}$ – $\frac{1}{6}$  in., often



hardly any, the raceme becoming altogether a spike; bracteoles smaller than the bracts. *Corolla* glabrous. *Capsule*  $\frac{1}{4}$  by  $\frac{1}{6}$  in.

24. **E. merguensis**, *T. Anders. in Journ. Linn. Soc.* ix. 452; stem very short, leaves obovate-oblong obtuse nearly glabrous, base cordate, panicles minutely pubescent, sepals  $\frac{1}{8}$  in. lanceolate, corolla  $\frac{1}{4}$ — $\frac{1}{3}$  in.

MERGUI; *Helper* (Kew Distrib. n. 6081).

*Stem* 1–3 in., closely villous. *Leaves* 3 by  $1\frac{1}{4}$  in., tip rounded, subcoriaceous; petiole  $\frac{1}{4}$ — $\frac{1}{2}$  in. *Peduncles* several, 1–3 in., reddish; racemes 1–4 in., slender, simple or little divided, minutely pubescent or glabrate; bracts  $\frac{1}{8}$  in., narrow-lanceolate; lower pedicels scarcely  $\frac{1}{8}$  in.; bracteoles smaller than the bracts. *Corolla* narrow, glabrous. *Capsule* scarcely  $\frac{1}{8}$  in., broad lanceolate.

25. **E. gracilis**, *T. Anders. in Journ. Linn. Soc.* ix. 453; stem hardly any, leaves short-petioled large obovate-oblong nearly glabrous, panicles slender pubescent, sepals  $\frac{1}{8}$  in. sublinear, corolla  $\frac{1}{2}$  in. (and upwards) narrowly tubular.

MARTABAN; *Parish*.

*Leaves* 8 by 3 in., obtuse, minutely pubescent on the nerves beneath; petiole 0— $\frac{1}{3}$  in. *Peduncles* several, 3–5 in., slender; panicles compound; bracts  $\frac{1}{10}$  in., linear; pedicels 0— $\frac{1}{8}$  in.; bracteoles  $\frac{1}{16}$  in., linear. *Sepals* minutely pubescent. *Corolla* glabrous without when expanded, or nearly so. *Capsule*  $\frac{1}{4}$  in.

26. **E. coriacea**, *T. Anders. in Herb. Kew*; stem short closely villous, leaves elliptic nearly glabrous, raceme long densely softly minutely grey hairy, sepals  $\frac{1}{8}$  in. lanceolate, corolla  $\frac{1}{3}$  in. tube short, anthers shortly exsert.

MOULMEIN; *Lobb*.

*Stem* 4 in., almost woody at the base. *Leaves* 2 by 1 in., obtuse, base rhomboid, subcoriaceous, secondary nerves obscure; petiole  $\frac{1}{8}$ — $\frac{1}{3}$  in. *Peduncle*  $1\frac{1}{2}$  in.; raceme 4 in., many-fld.; bracts  $\frac{1}{3}$  in., narrow-lanceolate; lower pedicels  $\frac{1}{8}$  in.; bracteoles in., narrow-lanceolate. *Calyx* with dense soft, short, grey hair. *Corolla* with a very short cylindric base, a short funnel-shaped portion at the base of which the filaments are inserted, elliptic or oblong erect-patent lobes, closely patent glandular-hairy. *Stamens* and *pistil* of *Ebermaiera*; filaments densely patent hairy upwards. *Capsule*  $\frac{1}{8}$  in., oblong, as of *Ebermaiera*.—The corolla is nearly as in *Ophiorrhizophyllum*.

27. **E. parviflora**, *T. Anders. in Herb. Kew*; stem very short, leaves obovate-oblong glabrate except the nerves beneath, panicle compound slender minutely hairy, sepals  $\frac{1}{2}$  in. sublinear, corolla  $\frac{1}{8}$ — $\frac{1}{6}$  in. tube short, anthers subexsert.

MOULMEIN; *Lobb*.

*Stem* 1 in., subtomentose. *Leaves* 6 by  $2\frac{1}{4}$  in., obtuse, base rhomboid or almost rounded; petiole  $\frac{1}{4}$ — $\frac{3}{4}$  in. *Peduncle* 4 in., pubescent, with 9 scattered bracts  $\frac{1}{3}$  in. long; panicle  $4\frac{1}{2}$  by 3 in.; bracts  $\frac{1}{8}$ — $\frac{1}{6}$  in., linear; lower pedicels scarcely  $\frac{1}{8}$  in.; bracteoles  $\frac{1}{16}$  in., subulate. *Corolla* as of *E. coriacea* but smaller, the external hairs shorter. *Filaments* glabrous except near the base; anther-cells ovoid, minutely puberulous. *Pistil* as of *E. coriacea*.—Closely allied to *E. coriacea*, but with much larger leaves, and smaller flowers.

28. **E. Beddomei**, *Clarke*; leaves elliptic acuminate at both ends puberulous on the nerves beneath, racemes solitary simple linear minutely pubescent, corolla  $\frac{1}{8}$ — $\frac{1}{6}$  in. funnel-shaped.

TENASSERIM; Mt. Mooleeyit, *Beddome*.

*Stems* densely pubescent. *Leaves*  $4\frac{1}{4}$  by  $1\frac{1}{2}$  in., membranous, whitened underneath;



petiole  $1\frac{1}{4}$  in., pubescent; the uppermost leaf sometimes short-petioled, rounded at the base. *Peduncle*  $\frac{1}{2}$  in.; raceme 4–5 in.; bract near the base of the pedicel  $\frac{1}{10}$  in., linear-lanceolate; bracteoles  $\frac{1}{12}$  in., linear-lanceolate, minutely pubescent. *Calyx-segments* 5, unequal,  $\frac{1}{12}$ – $\frac{1}{8}$  in., linear-lanceolate, minutely pubescent. *Corolla* funnel-shaped, tube very short. *Filaments* glabrous; anther-cells ovoid, irregularly subdivaricate.—Allied to *E. coriacea*, T. Anders.

## V. OPHIORRHIZIPHYLLON, Kurz.

An erect herb. *Leaves* opposite, petioled, elliptic, entire. *Spikes* very long, many-fl.; bracts narrowly oblong, exceeding the calyx; bracteoles small. *Sepals* 5, subequal, narrowly lanceolate. *Corolla* shortly tubular, curved at the mouth; lobes 5, elliptic, suberect. *Stamens* 2; filaments long, exsert, glabrous; anther-cells 2, oblong, muticous, separate, approximate, erect. *Disc* inconspicuous. *Ovary* glabrous; style long, glabrous, shortly 2-lobed; ovules very many. *Capsule* oblong and seeds as of *Ebermaiera*.

**O. macrobotryum**, Kurz in Journ. As. Soc. 1871, pt. ii. 76.

MARTABAN; Thoungyen, Brandis. KAREN HILLS; Kurz.

*Stem* 6–10 in., undivided, pubescent upwards. *Leaves* 6 by  $2\frac{1}{2}$  in., cuneate, subacute at each end, glabrous, or pubescent on the nerves beneath; petiole  $\frac{1}{4}$ – $1\frac{1}{4}$  in. *Peduncles* 1–3, subterminal, 1–3 in.; spikes 3–7 in.; bracts  $\frac{1}{4}$  in., glabrescent; bracteoles  $\frac{1}{8}$  in., linear. *Sepals*  $\frac{1}{6}$ – $\frac{1}{3}$  in., pubescent. *Corolla*  $\frac{1}{4}$  in., white or pale rose, minutely pubescent without. *Stamens* inserted in a ring of hairs, 2 small staminodes added. *Capsule*  $\frac{1}{4}$  in.

## VI. CARDANTHERA, Ham.

Herbs, often viscid, aromatic. *Leaves* opposite, upper toothed rarely entire, lower often pinnatifid or in water pectinate. *Flowers* spiked or whorled, or 1–3 together in opposite axils; bract or bracteoles often suppressed. *Sepals* narrow, often unequal. *Corolla* nearly straight, tube shorter than the calyx; limb long, 2-lipped, twisted to the left in bud; palate transversely plicate-rugose, purple-rose and white. *Stamens* 4, didynamous; anthers of the posterior often smaller; anther-cells parallel. *Ovary* narrow; style sparsely hairy. *Capsule* sessile, narrow, 40–100-seeded, bearing seeds from the very base. *Seeds* small, ovoid, somewhat compressed, glandular-puberulous or glabrous; retinacula minute, conical, soft, not curved.—Species 10, Indian and Tropical African.

*C. Thwaitesii* has solitary flowers, a plane palate, 2 stamens, and stronger retinacula.

Subgenus 1. **Eucardanthera**. *Stamens* 4, fertile. *Flowers* mostly in opposite axils.

\* *Spikes* terminal, bracts 4-ranked imbricated in fruit.

1. **C. uliginosa**, Ham. mss.; Benth. in Gen. Pl. ii. 1074; stem pubescent upwards, leaves subsessile oblong or subovate entire or crenate, bracts round ovate. *Ruellia uliginosa*, Linn. f. Suppl. 290; Roth Nov. Sp. 306, obs.; Roxb. Fl. Ind. iii. 52; Wall. Cat. 2378, chiefly. *Adenosma uliginosa*, Nees in Br. Verm. Schrift. iii. 298, and in Wall. Pl. As. Rar. iii. 79, and in DC. Prodr. xi. 69 (excl. syn. *Ruellia ringens*); T. Anders. in Journ. Linn. Soc. ix. 455.



In drying-up rice-swamps, S. MADRAS; frequent. CEYLON; *Walker*. SIKKIM TERRAI; *Herb. Griffith*.

Annual, 1–1½ ft., erect or decumbent, branching from the base. *Leaves* 1 by ½ in., glabrous or subpubescent. *Spikes* 1–3 in., scarcely interrupted at the base even in fruit; bracts ¼ in., from elliptic to cordate, glabrous or puberulous; bracteoles ½ in., obovate or elliptic. *Sepals* ½ in., linear, pubescent. *Corolla* ½ in., puberulous. *Anthers* of the posterior stamens half as large as of the anterior. *Capsule* ½ in., minutely pilose upwards.—Much confused by the older botanists with the universal *Hygrophila polysperma*, to which I suspect Miquel's Javanese *C. uliginosa* should be referred.

†† *Whorls or spikes axillary; fruiting interrupted at the base.*

2. **C. Griffithii**, *Benth. in Gen. Pl.* ii. 1074; leaves spatulate oblong or elliptic crenulate pubescent, spikes terminal interrupted at the base in fruit, corolla ¼ in. *Adenosma Griffithii*, *T. Anders. in Journ. Linn. Soc.* xi. 454.

UPPER ASSAM; Suddiya, *Griffith* (Kew Distrib. n. 6087).—DISTRIB. N. Burma.

Annual, decumbent, rooting; branches 1 foot, pubescent. *Leaves* 1½ by ⅔ in., subpetioled, obtuse; on the barren shoots smaller, broader. *Spikes* 1–4 in., pubescent, axillary and forming terminal panicles; lower bracts distant (at least in fruit), leaf-like, often containing 2–3 flowers; proper bract ¼ by ⅙ in., elliptic; bracteoles ½ in., narrowly oblong. *Sepals* linear-lanceolate. *Corolla* purple, puberulous. *Anthers* of the posterior stamens smaller than those of the anterior. *Ovary* nearly glabrous, a few gland-tipped hairs about its apex. *Capsule* ¼ in.

3. **C. balsamica**, *Benth. in Gen. Pl.* ii. 1074; branches glabrous upwards, leaves petioled oblong crenate, flowers mostly in axillary whorls, sepals longer than the bracts linear-lanceolate one larger than the others. *Ruellia balsamica*, *Linn. f. Suppl.* 289. *Adenosma balsamea*, *Spreng. Syst.* ii. 829; *Wall. Cat.* 9082; *Wight Ic.* t. 446; *Nees in DC. Prodr.* xi. 68; *T. Anders. in Journ. Linn. Soc.* ix. 454.

S. DECCAN PENINSULA and CEYLON; in rice-swamps, frequent.

Annual, decumbent or erect, branches 6–15 in.; glabrous, or the inflorescence puberulous; lineolate with raphides. *Leaves* 2 by ⅔ in., obtuse, base attenuate; petiole ¼ in.; lower leaves sometimes pectinate or pinnatifid. *Whorls* usually numerous, distinct; flowers 1–5-nate; bract ⅓–½ in., obovate or elliptic; bracteoles similar, but smaller, in crowded whorls, often suppressed. *Sepals* ½ in., not widened upwards. *Corolla* ½ in., nearly glabrous. *Anthers* of the posterior stamens smaller than the anterior. *Capsule* nearly ½ in., puberulous upwards.

VAR. *Thymus*; leaves ⅓ in., corolla ¼ in., capsule scarcely ¼ in. *Adenosma Thymus*, *Nees in Wall. Pl. As. Rar.* iii. 79, and in *DC. Prodr.* xi. 69, *excl. syn.*; *T. Anders. in Journ. Linn. Soc.* ix. 454. *Ruellia cernua*, *Heyne*; *Wall. Cat.* 2380 (part of letter B only), *not of Roxb.*—Deccan Peninsula, *Heyne*. *Nees* and *T. Anderson* place this next *C. triflora*, Ham., from which *Nees* carefully distinguishes it; the example is almost certainly a starved specimen of *C. balsamica*.

4. **C. verticillata**, *Benth. in Gen. Pl.* ii. 1074; branches pubescent upwards, leaves often petioled oblong or elliptic crenate, flowers mostly in axillary whorls, sepals longer than the bracts linear-spathulate. *Ruellia verticillata*, *Wall. Cat.* 2409. *Adenosma verticillata*, *Nees in Wall. Pl. As. Rar.* iii. 79, and in *DC. Prodr.* xi. 69; *Wight Ic.* t. 1524; *T. Anders. in Journ. Linn. Soc.* ix. 454.

DECCAN PENINSULA; Carnatic, *Heyne*, *Wight*; Concan, *Stocks*, &c. CEYLON; *Thwaites*.

*Leaves* often somewhat pubescent, especially on the midrib beneath. *Inflorescence*



ciliate-pubescent. *Sepals* wider upwards.—Scarcely specifically separable from *C. balsamica*.

5. **C. triflora**, *Ham. mss.*; *Benth. in Gen. Pl.* ii. 1074; pubescent, leaves ovate or round crenate-serrate, flowers mostly in axillary whorls, sepals equalling the bracts linear. *Ruellia triflora*, *Roxb. Hort. Beng.* 46, and *Fl. Ind.* iii. 52. *Adenosma triflora*, *Nees in Wall. Pl. As. Rar.* iii. 79, and in *DC. Prodr.* xi. 68; *Wall. Cat.* 7147; *T. Anders. in Journ. Linn. Soc.* ix. 454.

On the margin of water; BENGAL, very common. ASSAM, PEGU and SINGAPORE.

Annual, decumbent, rooting at the base, 1 foot. Lower leaves often pinnatifid, in water large, pectinate, membranous; cauline  $\frac{1}{2}$ –1 in. diam., tip rounded, base cuneate or subpetioled, somewhat closely sharply toothed. Flowers 1–3-nate; bracts nearly  $\frac{1}{2}$  in., obovate, sometimes toothed; bracteoles  $\frac{1}{4}$  in., oblong. *Sepals* hairy, one longer than the others, very acute. *Corolla*  $\frac{1}{3}$ – $\frac{1}{2}$  in. *Anthers* nearly equal. *Capsule*  $\frac{1}{4}$ – $\frac{1}{3}$  in., pubescent.

6. **C. avana**, *Benth. in Gen. Pl.* ii. 1074; subhirsute, leaves sessile oblong dentate, base obtuse, spikes elongate interrupted, flowers solitary, sepals exceeding the bracts linear. *Pedicularis* ? *avana*, *Wall. Cat.* 1007; *Benth. Scroph. Ind.* 52. *Synnema avanum*, *Benth. in DC. Prodr.* x. 538. *Adenosma biplicata*, *Nees in Wall. Pl. As. Rar.* iii. 79, and in *DC. Prodr.* xi. 68; *Wall. Cat.* 7146; *T. Anders. in Journ. Linn. Soc.* ix. 454.

BURMA; *Wallich, M'Leiland, &c.*—DISTRIB. Ava.

An annual weed, 1 foot, decumbent, rooting in mud, branches erect or procumbent. Lower leaves usually pinnatifid; upper 1–1 $\frac{1}{2}$  in., obtuse, base often subquadrate, with many patent white hairs. Spikes 1–5 in., weak; bract  $\frac{1}{4}$ – $\frac{1}{3}$  in., narrowly elliptic; bracteoles  $\frac{1}{5}$  in., narrowly oblong, obtuse. *Sepals*  $\frac{1}{3}$  in. and upwards, white-hirsute. *Corolla*  $\frac{1}{2}$ – $\frac{2}{3}$  in., pubescent without, purple. *Anthers* nearly equal. *Capsule*  $\frac{1}{3}$  in., puberulous.

7. **C. pinnatifida**, *Benth. in Gen. Pl.* ii. 1074; dusky pubescent, leaves petioled oblong or elliptic pinnatifid or crenate, flowers solitary axillary or in lax spikes, sepals linear slightly wider upwards sometimes toothed. *Nomaphila pinnatifida*, *Dalzell in Hook. Kew Journ.* iii. 38; *Dalzell & Gibs. Bomb. Fl.* 184; *Hook. Ic. Pl.* t. 843. *Adenosma pinnatifidum*, *T. Anders. in Journ. Linn. Soc.* ix. 455; *Bedd. Ic. Pl. Ind. Or.* t. 246.

W. DECCAN PENINSULA; Concan and Canara, *Dalzell, Beddome, &c.*; Mangalore, *Wight*.

Biennial; branches 1–2 ft. Leaves 2–4 in., deeply pinnatifid; lobes numerous, oblique, oblong; or smaller, or  $\frac{1}{2}$  in. and crenate on the same plant, cuneate or spatulate, more or less petioled. Spikes 1–4 in., terminal, weak, hardly interrupted, many-fl.; or more commonly flowers few, distant, solitary, sometimes on very short axillary branches appearing pedicelled; bracts  $\frac{1}{4}$  in., elliptic; bracteoles  $\frac{1}{5}$  in., oblong. *Sepals*  $\frac{1}{4}$  in. *Corolla*  $\frac{1}{2}$  in. *Anthers* subequal; cells parallel, base not divaricate nor cordate. *Capsule* nearly  $\frac{1}{3}$  in., glabrous.

Subgenus 2. **Plæsiantha**. *Stamens* 2, fertile. *Flowers* solitary, on alternate axils. *Seeds* densely elastically hairy.

8. **C. Thwaitesii**, *Benth. in Gen. Pl.* ii. 1075; pubescent, leaves spatulate-oblong entire, flowers small subsessile in lax compound cymes. *Adenosma Thwaitesii*, *T. Anders. in Thwaites Enum.* 224, and in *Journ. Linn. Soc.* ix. 455.

CEYLON; Batticaloa, in the tropical region, *Thwaites*.



Annual, 6–12 in., erect, branched, viscid. *Leaves* 1–1½ in., obtuse, base much attenuate or petioled. *Flowers* very numerous; cymes dichasial, going off into sympodes; upper branches of the cyme in appearance scorpioid with distant flowers, i. e. at each bifurcation one branch with one flower is suppressed; bracts  $\frac{1}{8}$  to  $\frac{1}{6}$  in., ovate or elliptic; bracteoles small or 0. *Sepals*  $\frac{1}{2}$  in., linear, unequal. *Corolla*  $\frac{1}{4}$  in., puberulous; lobes twisted to the left; palate not transversely plicate. *Anthers* subquadrate; posterior stamens reduced to filaments. *Ovary* glabrous, tip glandular-hairy; style sparsely hairy. *Capsule*  $\frac{1}{4}$  in., bearing seeds from the base. *Seeds* 40–60, ovoid, slightly compressed, the white fine hairs starting out on all sides when moistened; retinacula conical, slightly curved, scarcely hardened.—Possibly a distinct genus, resembling *Brillantaisia* except that it is the posterior stamens that are imperfect in this.

## VII. **HYGROPHILA**, Br.

Herbs, (in *H. spinosa*) spinescent. *Leaves* opposite, lanceolate or obovate, entire. *Flowers* sessile, in terminal heads or in axillary whorls; bracts elliptic or lanceolate; bracteoles oblong or lanceolate, shorter than the calyx. *Calyx* tubular, 5-fid (or in *H. spinosa* 4-partite); teeth lanceolate or linear. *Corolla* blueish-purple, nearly glabrous; tube ventricose at the apex; limb deeply 2-lipped, oblong, straight. *Stamens* didynamous, posterior similar to the anterior, or smaller, or rudimentary, filaments glabrous; anthers oblong, cells equal, divaricate or connate at the base. *Ovary* oblong, tip hairy; style long hairy, stigma simple linear. *Capsule* linear or narrowly oblong, bearing seeds from the base, 40–100-seeded, or in *H. spinosa* 2–8-seeded. *Seeds* ovoid, compressed, elastically white-hairy when wetted; retinacula hardened, curved and acute.—Species 18, tropical and subtropical.

Subgenus. **Euhygrophila**. Unarmed. *Calyx* 5-toothed. *Capsule* with 8–100 minute seeds.

\* *Spikes terminal*.

1. **H. polysperma**, T. Anders. in *Journ. Linn. Soc.* xi. 456; small, procumbent, leaves oblong or ovate nearly entire glabrous or puberulous, spikes terminal dense oblong or linear, fertile stamens 2. *Boiss. Fl. Orient.* iv. 519. *Justicia polysperma*, Roxb. *Hort. Beng.* 3, and *Fl. Ind.* i. 119; *Wall. Cat.* 2483. *Ruellia uliginosa*, *Wall. Cat.* 2378, partly. *Hemiadelphus polysperma*, Nees in *Wall. Pl. As. Rar.* iii. 80, and in *DC. Prodr.* xi. 80 (excl. syn. Roth); *Wight Ill.* t. 164 b, fig. 3, and  *Ic.* t. 1492; *Griff. Notul.* iv. 135.

Throughout INDIA in wet places, alt. 0–5000 ft., from the Punjab and Bhotan to the S. Deccan and Malacca.—DISTRIB. Cabul.

Annual, 6–18 in., branching and rooting. *Leaves*  $\frac{1}{2}$ –1½ in., from narrowly oblong to ovate, base spatulate or petioled. *Spikes* 1–5 in., somewhat pubescent; bracts  $\frac{1}{4}$ – $\frac{1}{2}$  in., broadly elliptic, imbricate; bracteoles  $\frac{1}{4}$  in., lanceolate. *Sepals*  $\frac{1}{4}$  in., linear, hairy. *Corolla*  $\frac{1}{3}$  in., slender, pubescent, pale blue or white. *Anthers* oblong, cells slightly divaricate at the base; posterior stamens reduced to teeth. *Ovary* hairy at the apex. *Capsule*  $\frac{1}{4}$ – $\frac{1}{3}$  in.; seeds 20–32.—The examples from Tenasserim and Malacca are larger and more glabrous; the capsules  $\frac{1}{2}$  in.

2. **H. Serpyllum**, T. Anders. in *Journ. Linn. Soc.* ix. 456; procumbent, leaves small short-petioled ovate or oblong hairy, spikes ovate or shortly oblong, anthers of the posterior stamens half as long as of the anterior. *Ruellia polysperma*, Roth *Nov. Sp.* 305. *Adenosma polysperma*, Spreng. *Syst.* ii. 829. *Physichilus Serpyllum*, Nees in *Hook. Comp. Bot.*



*Mag.* ii. 311, and in *DC. Prodr.* xi. 81; *Dalz. & Gibs. Bomb. Fl.* 184; *Wight Ic.* t. 1493.

W. DECCAN PENINSULA, from Malwa (*Edgeworth*) to Mysore; frequent in the Concan.

*Rootstock* woody; stems 4–16 in., procumbent or creeping. *Leaves*  $\frac{1}{4}$ –1 in., from lanceolate to orbicular, entire, minutely strigose and with long lax white hairs, lineolate with raphides, nearly glabrate or minutely closely tomentose beneath; petiole 0– $\frac{1}{8}$  in., but in some basal leaves  $\frac{1}{2}$ –1 in. *Spikes* dense, white-strigose; bracts  $\frac{1}{4}$  in., elliptic; bracteoles  $\frac{1}{4}$  in., oblong. *Sepals*  $\frac{1}{4}$  in., linear. *Corolla*  $\frac{1}{3}$ – $\frac{1}{2}$  in.; tube ventricose upwards, limb long, deeply 2-lipped. *Style* hairy. *Capsule*  $\frac{1}{4}$  in., 8–10-seeded.—The figure of Wight (*Ic.* t. 1493) shows the 4 anthers subequal, but this is not the case in his example from which he notes his Icon was taken. The synonym, *Ruellia polysperma*, Roth, has been always supposed to have been *Hygrophila polysperma*, T. Anders.; but as Roth says his plant had didynamous stamens and ovate heads, his description must belong here, whatever his plant was.—The leaves of *H. Serpyllum* vary very much in form and indumentum.

VAR. *Hookeriana*; leaves orbicular obtuse cauline often distinctly petioled.—*Physichilus* sp. nn. 2, 3, *Herb. Ind. Or. H. f. & T.*—Concan; *Stocks.* Bombay, *Law.* A larger plant; cauline leaves often 1 in. diam., petiole  $\frac{1}{8}$ – $\frac{1}{4}$  in., with minute white bristly hairs, but none of the long white hairs characteristic of *H. Serpyllum* type.

3. **H. Stocksii**, *T. Anders. ms.*; cauline leaves petioled spathulate-elliptic, spikes ovate or shortly oblong, anthers of the posterior stamens  $\frac{1}{6}$  the length of the anterior.—*Physichilus* n. 4, *Herb. Ind. Or. H. f. & T.*

CONCAN; *Stocks.*

Branches 18 in., stout; internodes 2–3 in. *Cauline leaves*  $2\frac{1}{2}$  by 1 in.; petiole  $\frac{2}{3}$  in. *Corolla*  $\frac{1}{2}$  in. *Anthers* of the posterior stamens minute, but (at least sometimes) they appear to contain a few pollen-grains.—Reduced to a Var. of *H. Serpyllum* by T. Anders. (*in Journ. Linn. Soc.* ix. 456), but subsequently marked by him as a species.

\*\* *Whorls axillary, distinct.*

4. **H. salicifolia**, *Nees in Wall. Pl. As. Rar.* iii. 81, and in *DC. Prodr.* xi. 92; erect, leaves lanceolate glabrous, bracteoles lanceolate acute, calyx in flower divided half-way down lobes linear hispid-ciliate, capsule a little longer than the calyx. *Wight Ic.* t. 1490; *Dalz. & Gibs. Bomb. Fl.* 184. *Ruellia salicifolia*, *Vahl Symb.* iii. 84; *Roxb. Fl. Ind.* iii. 50; *Wall. Cat.* 2373. *R. longifolia*, *Roth Nov. Sp.* 306.

Throughout INDIA and CEYLON, very common.

*Stems* 1–3 ft., nearly glabrous. *Leaves*  $2\frac{1}{2}$  by  $\frac{1}{3}$ – $\frac{2}{3}$  in., narrowed at both ends, lineolate by raphides; petiole 0– $\frac{1}{4}$  in.; bract  $\frac{1}{4}$ – $\frac{1}{3}$  in., ovate or elliptic; bracteoles  $\frac{1}{2}$  as long as the calyx. *Calyx*  $\frac{1}{3}$ – $\frac{1}{2}$  in., divided to the base in fruit. *Corolla*  $\frac{1}{2}$ – $\frac{2}{3}$  in., pale purple. *Stamens* 4, fertile; anthers subequal. *Capsule*  $\frac{1}{2}$ – $\frac{2}{3}$  in., 20–28-seeded.—The whole of the species of this section are included under the present by T. Anders. (*in Journ. Linn. Soc.* ix. 456), which then has a geographic area extending through S.E. Asia, Malaya, Trop. Australia, Trop. America; but if this view be taken, the name of the species should be *H. angustifolia*, Br. (*Prodr.* 479; *Nees in DC. Prodr.* xi. 91).

VAR. *assurgens*; stem decumbent or geniculate rooting with erect branches, leaves obovate-oblong or elliptic subacute. *H. assurgens*, *Nees in DC. Prodr.* xi. 90, *excl. syn. and var. β.* *H. radicans*, *Nees in Wall. Pl. As. Rar.* iii. 81, and in *DC. l. c.* 92. *Ruellia radicans*, *Wall. Cat.* 2410.—E. Bengal, frequent; *Wallich, &c.* Malacca; *Maingay* (Malaya).

VAR. *dimidiata*; leaves obovate or elliptic glabrous densely lineolate especially on the upper surface, base attenuate. *H. dimidiata*, *Nees in Wall. Pl. As. Rar.* iii. 81;



*Wall. Cat.* 7150. *H. obovata*, *Nees in Wall. Pl. As. Rar.* iii. 81, and in *DC. Prodr.* xi. 91 (not of Wight, nor *Ruellia obovata*, *Roxb.*). *H. undulata*, *Nees in DC. l. c.* 91, partly (not *Ruellia undulata*, *Vahl*).—Prome; *Wallich*. Mergui; *Griffith*.—Distrib. Java, Borneo. Lateral nerves of the leaves patent, arcuate, prominent, regular. Whorls often dimidiate, but entire often, as in *Wallich*'s type specimen.

5. ***H. quadrivalvis***, *Nees in Wall. Pl. As. Rar.* iii. 80, and in *DC. Prodr.* xi. 89; erect, leaves lanceolate or elliptic narrowed at both ends glabrate, bracteoles oblong obtuse, calyx in flower divided  $\frac{1}{3}$  the way down lobes lanceolate minutely strigillose, capsule much exceeding the calyx. *H. obovata*, *Wight Ic.* t. 1489; *Nees in Pl. Hohenack.* n. 292. *H. undulata*, *Nees in DC. Prodr.* xi. 91, partly. *Ruellia quadrivalvis*, *Wall. Cat.* 2374, type sheet. *R. undulata*, *Vahl Symb.* iii. 82.—*Rheede Hort. Mal.* ii. t. 46.

From BENGAL to CEYLON and MALACCA, common.

Closely resembling *H. salicifolia* except in the points stated. *Leaves* usually larger, in *Ruellia undulata* attaining 4 by  $1\frac{3}{4}$  in., undulate on margin. *Calyx* often gamosepalous long after flowering. *Capsule* frequently  $\frac{3}{4}$  in., stouter than in *H. salicifolia*.—*Ruellia barbata*, *Vahl Symb.* iii. 83, adduced here by *Nees*, is stated by *Vahl* to have biaristate anthers, and his description does not otherwise fit well.

6. ***H. phlomoides***, *Nees in Wall. Pl. As. Rar.* iii. 80, and in *DC. Prodr.* xi. 90; erect, leaves sessile elliptic or oblong hairy, whorls of flowers hirsute often distant, calyx in flower divided half-way down teeth linear hispid. *Ruellia phlomoides*, *Wall. Cat.* 2376, type sheet. *R. hirsuta*, *Roxb. Fl. Ind.* iii. 51. *Dipteracanthus ciliatus*, *Nees in Wall. Cat.* 715.

BENGAL, SIKKIM and ASSAM, near the base of the hills; CACHAR, CHITTAGONG, PEGU.

*Stems* 2–3 ft., hirsute upwards. *Leaves* often 3–6 in., base narrowed, mostly quite sessile. Whorls of flowers dense; bracteoles linear-oblong, as long as the calyx-tube. *Corolla*  $\frac{3}{4}$  in. *Capsule*  $\frac{1}{2}$  in., somewhat exceeding the calyx.

VAR. *Roxburghii*; branched or decumbent, leaves obovate often shortly petioled usually small hairy or nearly glabrous, calyx-teeth linear-lanceolate, corolla  $\frac{1}{2}$  in. *H. obovata*, *Griff. Notul.* iv. 134. *Ruellia obovata*, *Roxb. Fl. Ind.* iii. 51; *Wall. Cat.* 2375, type sheet.—Chittagong, *Roxburgh*; Soonderbunds, *J. D. H.*, &c.; Pegu, *Beddome*; Mergui, *Griffith*.

VAR. *repens*; procumbent, rooting, leaves  $\frac{1}{2}$ – $1\frac{1}{2}$  in. obovate, flowers rather smaller. Silhet; *H. f. & T.*, &c.

7. ***H. incana***, *Nees in DC. Prodr.* xi. 91 (excl. syn. *Roxb.*); erect, innovations closely softly white-hairy, leaves narrowly lanceolate adult densely lineolate on both surfaces, calyx in flower divided more than half-way down, teeth linear softly white-hairy and hispid. *Ruellia incana*, *Heyne in Herb. Rottler*. *R. mollissima*, *Klein ms.*, not of *Vahl*.

DECCAN PENINSULA; *Rottler*.

*Leaves* 4 by  $\frac{2}{3}$  in., very acute at both ends; petiole hardly any. *Capsule*  $\frac{1}{2}$  in., shortly exceeding the calyx.—Very distinct by its soft close white hairiness, to which scattered long white hispid hairs are added. It is altogether remote from *Ruellia obovata*, *Roxb.* (= *H. phlomoides*, *Nees* Var.), of which *Roxburgh*'s picture is in *Herb. Kew*.

Subgenus 2. ***Asteracantha***. Spinous. *Calyx* 4-partite. *Seeds* 4–8.

8. ***H. spinosa***, *T. Anders. in Thwaites Enum.* 225, and in *Journ. Linn. Soc.* vii. 22; stout, erect, hispid, leaves lanceolate, whorls axillary spinose



hispid. *H. longifolia*, *Kurz in Journ. As. Soc.* 1870, ii. 78. *Barleria longifolia*, *Linn. Amœn. Acad.* iv. 320; *Wall. Cat.* 2505. *B. hexacantha*, *Moris in Mem. Acad. Torin.* xxxvi. 200, t. 7. *Ruellia longifolia*, *Roxb. Fl. Ind.* iii. 50. *Asteracantha longifolia*, *Nees in Wall. Pl. As. Rar.* iii. 90, and in *DC. Prodr.* xi. 247; *Dalz. & Gibs. Bomb. Fl.* 189; *Wight Ic.* t. 449. *A. auriculata*, *Nees in DC. Prodr.* xi. 248, with syn.—*Rheede Hort. Mal.* ii. t. 45; *Jones in As. Research.* iv. 291.

Throughout INDIA in ditches, abundant; from the Himalaya to CEYLON (not seen from Malay Peninsula).

*Stems* 2-5 ft., usually fascicled and undivided. *Leaves* 3-7 in., subsessile, acute at both ends, sparsely hispid with long white hairs. Whorls large, dense, with (normally 6) straight stout spines  $\frac{1}{2}$ -1 $\frac{1}{2}$  in.; bracts  $\frac{1}{2}$ -1 in., lanceolate; bracteoles  $\frac{1}{4}$ - $\frac{1}{3}$  in., narrow. *Sepals*  $\frac{1}{3}$ - $\frac{1}{2}$  in., lanceolate; upper rather the largest, lower obtuse emarginate or shortly bifid. *Corolla* 1 in., nearly glabrous, pale blue-purple. *Anthers* oblong, subequal. *Capsule*  $\frac{1}{3}$  in., shorter than the sepals, linear-oblong, 4-8-seeded from the base.

### VIII. NOMAPHILA, Blume.

Erect herbs. *Leaves* petioled, entire. *Cymes* axillary, subsessile; branches unilateral, sympodal upwards; flowers pedicelled; bracts linear, minute; bracteoles 0. *Sepals* 5, linear, one somewhat larger. *Corolla* tubular, ventricose upwards; limb deeply 2-lipped; lobes 5, twisted to the left, edges narrowly overlapping in bud. *Stamens* 4, didynamous, glabrous; anthers 2-celled, lower somewhat smaller; cells oblong, parallel, muticous. *Ovary* oblong; style linear, stigma simple linear. *Capsule* linear, seed-bearing from the base, 8-32-seeded. *Seeds* ellipsoid, reticulate, elastically white-hairy when wetted; retinacula hardened, hooked, but slender.—Species 7, in S.E. Asia, Madagascar, and Trop. Africa.

1. **N. Parishii**, *T. Anders. in Journ. Linn. Soc.* ix. 455; leaves lanceolate pubescent or mature nearly glabrous, cymes and calyx glandular-pubescent, sepals subulate. *N. pubescens*, *Kurz in Journ. As. Soc.* 1871, pt. ii. 74, *excl. all syn.*

MOULMEIN; *Falconer, Parish.* PEGU; *Kurz, Brandis.* TENASSERIM; *Beddome.*—DISTRIB. Java.

*Stem* 1-2 ft., pubescent upwards. *Leaves* 3 by  $\frac{1}{2}$ - $\frac{3}{4}$  in., acute at both ends (larger ovate fide T. Anders.), young minutely softly pubescent, mature glabrate lineolate above, sparsely pubescent or glabrate beneath; petiole  $\frac{1}{2}$ -1 $\frac{1}{2}$  in. *Cymes* 1 $\frac{1}{2}$  in. diam.; bracts  $\frac{1}{8}$ - $\frac{1}{6}$  in., opposite; pedicel in one axil  $\frac{1}{8}$ - $\frac{1}{6}$  in., in the other suppressed. *Sepals*  $\frac{1}{3}$  in., one slightly longer than the others, acute. *Corolla*  $\frac{2}{3}$ -1 in., nearly glabrous. *Ovary* glandular; style patently hairy. *Capsule*  $\frac{1}{2}$  in., 32-seeded, pubescent from the base.—Very near to, and doubtfully distinct from the Javan *N. corymbosa* (Blume *Bijd.* 804; *Nees in DC. Prodr.* xi. 84). Col. Beddome has collected in Tenasserim two forms, one with the calyx and corolla half as large again as in the other; but no other difference can be found.

2. **N. stricta**, *Nees in DC. Prodr.* xi. 84, *excl. syn.*; leaves broadly lanceolate mature glabrate, cymes nearly glabrous, sepals linear subobtuse glabrate or minutely puberulous, ovary nearly glabrous except at the tip. *Ruellia paniculata*? *Heyne in Herb. Rottler.*

DECCAN PENINSULA?; *Rottler.*—DISTRIB. Malaya to the Philippines.

This plant is in Rottler's Madras collection at Kew, but it may be doubted (see T. Anders. in *Journ. Linn. Soc.* ix. 456) whether it was collected wild in India. It closely resembles *N. corymbosa*, Bl., except in the points specified. Nees' synonymy is all wrong: *Justicia stricta*, *Vahl Symb.* ii. 6, has calyx shorter than the bracts; *J. pubescens*, *Lamk. Ill.* i. 40, has ovate bracts, and is from Guinea; while *J. canescens*,



*Lamk. Ill.* i. 40 (referred here by Nees in *DC. Prodr.* xi. 722), is an American plant of another genus.

### IX. CALOPHANES, *D. Don.*

Perennial herbs. *Leaves* opposite, petioled, entire. *Flowers* in axillary clusters or short cymes; bracts and bracteoles narrow. *Calyx* tubular; teeth 5, subequal, lanceolate or subulate. *Corolla* tubular, mouth obscurely 2-lipped; lobes 5, obtuse, twisted to the left in bud, patent in flower. *Stamens* 4, perfect, didynamous, filaments glabrous or hairy; anthers similar, 2-celled; cells oblong, parallel, base minutely mucronate or spurred. *Ovary* glabrous, shortly stalked; ovules 2 in each cell; style linear, hairy, stigma simple linear. *Capsule* oblong, base for a short space narrowed solid. *Seeds* 4, orbicular, much compressed, densely elastically white-hairy when wetted; retinacula strong, curved.—Species 30, in S.E. Asia, Africa and America.

\* *Pedicels hardly any, flowers axillary 2–8 together or solitary.*

1. **C. Nagchana**, *Nees in DC. Prodr.* xi. 109; prostrate, glabrous or hoary, leaves spathulate-elliptic or obovate, flowers clustered, bracteoles small linear, calyx-teeth longer than the tube, filaments glabrous, anther-cells mucronate. *C. depressa*, *T. Anders. in Thwaites Enum.* 225, and in *Journ. Linn. Soc.* ix. 459. *Ruellia Nagchana*, *Ham. in Wall. Cat.* 2396. *R. erecta*, *Burm. Fl. Ind.* 135, t. 41, fig. 3. *R. depressa & cernua*, *Wall. Cat.* 2379, 2380, chiefly. *Dipteracanthus Nagchana*, *Nees in Wall. Pl. As. Rar.* iii. 82. *Dyschoriste depressa & cernua*, *Nees in l. c.* 81, and in *DC. Prodr.* xi. 106.

DECCAN PENINSULA; *Rottler, Dr. Shuter, &c.* BEHAR; *Patna, Ham., J. D. H.* CEYLON; *Thwaites.*

*Stems* 6–18 in., branched, lineolate, sometimes obscurely scabrid. *Leaves*  $\frac{1}{2}$ –1 $\frac{1}{2}$  in., obtuse, base attenuate; petiole 0– $\frac{1}{4}$  in. *Bracts* small, spathulate-elliptic or 0; bracteoles  $\frac{1}{8}$  in. *Calyx* lineolate, glabrous or puberulous; tube  $\frac{1}{2}$  in., teeth  $\frac{1}{4}$  in. *Corolla* scarcely so long as the calyx, puberulous, flesh-coloured or blueish, palate not corrugate. *Filaments* connate near the base; anther-cells very shortly but distinctly mucronate. *Capsule*  $\frac{1}{3}$  in.—*T. Anderson* has not indicated the grounds on which he keeps *C. Nagchana* and *C. depressa* distinct; *Nees* says *C. Nagchana* differs by having the bracteoles spathulate, which is not the case in his type specimen. In *C. Nagchana*, where the flowers are clustered, the bracts of the upper flowers are much smaller, the bracteoles 0– $\frac{1}{12}$  in., but this is exactly as in *Ruellia cernua*, *Wall.*

2. **C. littoralis**, *T. Anders. in Thwaites Enum.* 225, and in *Journ. Linn. Soc.* ix. 460; shrubby, nearly glabrous, leaves small obovate, flowers solitary or 2–3 together axillary, bracteoles elliptic, calyx-teeth shorter than the tube, filaments glabrous, anther-cells mucronate. *Justicia madurensis*, *Burm. Fl. Ind.* 9, t. 4, fig. 3. *Ruellia littoralis*, *Linn. f. Suppl.* 289; *Roth Nov. Sp.* 300; *Wall. Cat.* 2381. *Dyschoriste littoralis*, *Nees in Wall. Pl. As. Rar.* iii. 81, and in *DC. Prodr.* ix. 106; *Wight Ic.* t. 447.

S. DECCAN PENINSULA; near the sea, *Perottet, Wight, &c.*; and inland at Coimbatore, *Beddome.* CEYLON; N. of the island, *Gardner.*

*Stems* 1–3 ft., sometimes woody, much branched, or elongate less stiff; innovations lineolate, sometimes hoary. *Leaves*  $\frac{1}{2}$  in. diam., obtuse, base cuneate or rounded; petiole 0– $\frac{1}{4}$  in. *Flowers* mostly solitary; bracteoles  $\frac{1}{8}$  in. *Calyx* densely lineolate, sometimes hoary; tube  $\frac{1}{4}$  in., teeth  $\frac{1}{8}$  in. lanceolate. *Corolla*  $\frac{3}{4}$  in. and upwards, nearly glabrous, narrowly cylindric below, funnel-shaped upwards. *Stamens, ovary, and capsule* nearly as in *C. Nagchana.*



\*\* *Cymes small, flowers pedicelled.*

3. **C. vagans**, *Wight Ic. t. 1526*; leaves ovate or oblong more or less pubescent, calyx-teeth long-linear hairy, filaments hairy, anther-cells with prominent white divaricate spurs at the base. *T. Anders. in Journ. Linn. Soc. ix. 459, excl. syn.* *Ruellia racemosa*, *Heyne in Herb. Rottler, not of Roxb.*

DECCAN PENINSULA, *Rottler*; Kurg, *Wight*; Concan, *Stocks*; Belgaum, *Ritchie*.

*Stems* 1–2 ft., erect or diffuse, branched; innovations softly pubescent, not lineolate. *Leaves*  $1\frac{1}{2}$ – $2\frac{1}{2}$  in., usually narrowed at both ends, mature pubescent on both surfaces or glabrate except a few hairs on the nerves or margin; petiole  $\frac{1}{4}$  in. *Cymes*  $1\frac{1}{2}$  in., or some short 3-fld., softly hairy; bracts  $\frac{1}{4}$  in., oblong; bracteoles  $\frac{1}{8}$  in., linear. *Calyx-tube*  $\frac{1}{6}$  in., teeth  $\frac{1}{3}$ – $\frac{1}{2}$  in. *Corolla*  $\frac{3}{4}$  in., pubescent, blueish, palate transversely plicate. Spurs of the *anther-cells* much larger than in the preceding species. *Capsule*  $\frac{1}{3}$  in.

4. **C. Dalzellii**, *T. Anders.*; *Bedd. Ic. Pl. Ind. Or. t. 248*; leaves ovate or oblong pubescent or nearly glabrate, calyx-teeth linear hairy, filaments glabrous or minutely hairy, anther-cells minutely mucronate at base or muticous. *C. rigidus*, *Dalz. ms.*—*Dipteracanthus* sp. n. 11, *Herb. Ind. Or. H. f. & T.*

CONCAN, *Dalzell*, *Stocks*; Poona, *Dalzell*, *Beddome*.

Closely resembling *C. vagans*, but cymes denser, pedicels rarely exceeding  $\frac{1}{8}$  in., calyx-teeth broader, sometimes linear-lanceolate, flowers rather larger, sometimes exceeding 1 in., and capsule  $\frac{1}{3}$ – $\frac{1}{2}$  in., 4-seeded (entirely of *Calophanes*).—The larger flowers and the stamens are quite as of *Ruellia*; the mucro of the anther-cells is either absolutely wanting or so minute that it requires a microscope to find it. Hence the plant was marked a *Dipteracanthus* by Bentham (not *Dipteracanthus vagans*, as T. Anders. states, which was T. Anderson's own mistake, not Bentham's); but as the ovules appear never more than 4, it must remain in *Calophanes*. It invalidates the genus *Calophanes* as distinguished from *Ruellia*.

## X. RUELLIA, Linn.

Herbs or undershrubs. *Leaves* opposite, entire. *Flowers* sessile or subsessile, solitary or clustered; bract 0; bracteoles large, exceeding the calyx except in *R. ciliata*. *Calyx* 5-partite or 5-fid; teeth subequal, narrow, acute. *Corolla* tubular-ventricose; limb more or less oblique; lobes subequal, rounded, twisted to the left in bud, patent in flower. *Stamens* 4, didynamous, filaments glabrous, unless near the base; anthers subequal, 2-celled; cells oblong, muticous, glabrous. *Ovary* glabrous; ovules in each cell 3–10; style long-linear, hairy, stigma simple linear (except in *R. macrosiphon*). *Capsule* clavate, base solid, cylindric, ellipsoid, seed-bearing upwards. *Seeds* large, thinly discoid, marginate, much imbricated, densely elastically hairy when wetted; retinacula large, hooked, strong.—Species 150, in all warm regions.

The generic character here given is narrowed to the section *Dipteracanthus* (Genus, Nees), to which section all the Indian species strictly belong. In other sections (Genera of Nees), reunited now with *Ruellia* in the Gen. Pl., the bracts, capsules and seeds recede materially from the characters of *Dipteracanthus*.

*Ruellia flagelliformis*, Roxb. Fl. Ind. iii. 47, came from the Moluccas.

1. **R. prostrata**, *Lamk. Encycl. vi. 349*; prostrate pubescent upwards, leaves small ovate sparsely hairy or nearly glabrous, bracteoles spathulate-elliptic or petioled ovate foliaceous, corolla 1 in. pale purple caducous.



*T. Anders. in Journ. Linn. Soc.* ix. 460; *Bedd. Ic. Pl. Ind. Or.* t. 282. *R. Wightiana*, *Wall. Cat.* 2397. *R. repens*, *Heyne in Herb. Rottler.* *Dipteracanthus prostratus*, *Nees in Wall. Pl. As. Rar.* iii. 81, and in *DC. Prodr.* xi. 124.

DECCAN PENINSULA, extending North to BEHAR; *J. D. H.*

*Stems* 6–18 in., much branched, nodes short, glabrous downwards. *Leaves*  $\frac{3}{4}$  in., subobtusely, lineolate by raphides and minutely sparsely pilose; petiole  $\frac{1}{8}$  in. *Flowers* few together or often solitary; bracteoles  $\frac{1}{3}$ – $\frac{3}{4}$  in., often altogether like the leaves. *Sepals*  $\frac{1}{4}$  in., linear, ciliate. *Corolla* pubescent, ventricose portion of the tube twice the cylindric portion. *Capsule*  $\frac{3}{4}$  in., pubescent, seed-bearing  $\frac{2}{3}$  its length. *Seeds* 16–20,  $\frac{1}{8}$  in. diam.

*VAR. dejecta*; diffuse sometimes rambling among bushes with very long nodes, leaves larger often 3 in. frequently acute. *Ruellia ringens*, *Roxb. Fl. Ind.* iii. 44; *Wall. Cat.* 2403. *R. repens*, *Wall. Cat.* 2384, chiefly. *R. deccanensis*, *Grah. Cat. Pl. Bomb.* 162. *Dipteracanthus dejectus*, *Nees in Wall. Pl. As. Rar.* iii. 82, and in *DC. Prodr.* xi. 125; *Dalz. & Gibs. Bomb. Fl.* 185, excl. syn. *D. prostratus*, *Griff. Notul.* iv. 135.—Throughout India, from the N. Punjab and Assam to Ceylon, very common (not seen from the Malay Peninsula).—Distrib. E. Africa. This variety passes into *R. prostrata* type by insensible gradations.

2. ***R. repens***, *Linn. Mant.* 89 (not of *Burm.* nor of *Heyne*); stem nearly glabrous, leaves ovate acuminate or lanceolate mature nearly glabrous, bracteoles spathulate elliptic or petioled ovate foliaceous, corolla  $\frac{3}{4}$  in. *Blume Bijdr.* 794; *T. Anders. in Journ. Linn. Soc.* ix. 460. *Dipteracanthus lanceolatus*, *Nees in Wall. Pl. As. Rar.* iii. 82, and in *DC. Prodr.* xi. 124.

MALAY PENINSULA; Moulmein, *Parish*; Mergui and Malacca, *Griffith*; Singapore, *Lobb.*—DISTRIB. Throughout Malaya to the Philippines. Siam.

Usually more glabrous with narrower leaves than *R. prostrata*, but can only be clearly separated by the smaller flowers; the capsule rarely exceeds  $\frac{1}{2}$  in.

3. ***R. patula***, *Jacq. Misc. Bot.* ii. 358, and *Ic. Pl. Rar.* i. t. 119; hoary pubescent, leaves ovate, bracteoles spathulate elliptic or petioled ovate foliaceous, corolla 1–1 $\frac{1}{2}$  in. *Lamk. Ill.* t. 550 (smaller than nat. size); *Wall. Cat.* 2385; *Roxb. Fl. Ind.* iii. 45; *T. Anders. in Journ. Linn. Soc.* ix. 460. *R. erecta*, *Roth Nov. Sp.* 308. *Dipteracanthus patulus*, *Nees in Wall. Pl. As. Rar.* iii. 82, and in *DC. Prodr.* xi. 126; *Wight Ic.* t. 1505; *Oerst. in Vidensk. Meddel. Kjob.* 1854, t. 4, fig. 19–21. *D. erectus*, *Nees in Wall. Pl. As. Rar.* iii. 82, and *Cat.* 7186. *Petalidium patulum*, *Dalz. & Gibs. Bomb. Fl.* 185.

DECCAN PENINSULA, extending to Scinde, Rajpootana and Bundelkund (*Edgeworth*). CEYLON, frequent.—DISTRIB. Arabia, Abyssinia, Ava.

Resembling *R. prostrata*, but densely closely pubescent. *Corolla* pubescent, very pale grey purple, the cylindric portion of the tube as long as the ventricose part.

4. ***R. longifolia***, *T. Anders. in Journ. Linn. Soc.* ix. 460; hairy, leaves linear-lanceolate, bracts linear-spathulate, calyx-lobes lanceolate scarcely longer than the tube, corolla  $\frac{2}{3}$  in. *Boiss. Fl. Orient.* iv. 519. *Dipteracanthus longifolius*, *Stocks in Hook. Kew Journ.* iv. 177.

SCINDE; *Stocks, Dalzell.*—DISTRIB. Beloochistan.

Woody at the base, with many ascending stems 12 in. high; whole plant with glandular viscous white or hoary pubescence. *Leaves* 2 by  $\frac{1}{2}$  in.; petiole continuous with the attenuate leaf-base. *Flowers* mostly solitary; bracteoles  $\frac{3}{4}$  in. *Calyx*  $\frac{1}{2}$  in. *Corolla* pubescent, blue. *Capsule*  $\frac{2}{3}$  in., pubescent, nearly as of *R. prostrata*.



5. **R. cernua**, *Roxb. Fl. Ind.* iii. 45; leaves oblong or elliptic acuminate hairy, bracteoles petioled elliptic acute leaf-like, sepals  $\frac{1}{2}$  in., corolla  $1-1\frac{1}{4}$  in. *T. Anders. in Journ. Linn. Soc.* ix. 460.

CHOTA NAGPORE; Parasnath, alt. 2000–4500 ft., *Thomson, Anderson, Clarke.*

*Rootstock* woody; annual stems 6–24 in., hairy upwards. *Leaves*  $3\frac{1}{2}$  by  $1-1\frac{1}{4}$  in., much acuminate, with scattered short white hairs on both surfaces; petiole  $\frac{2}{3}$  in. *Flowers* 1–3 together, axillary and terminal; bracteoles 1 in. *Sepals* exceeding  $\frac{1}{2}$  in., linear, hairy. *Corolla* pubescent, white with rose or pink-purple marks, tubular portion equalling the ventricose. *Stamens* of the genus. *Capsule*  $\frac{3}{4}$  in., as of *R. prostrata*.—The plant here described is the Parasnath one, which is a typical *Ruellia* sect. *Dipteracanthus*, and which Anderson identifies confidently with Roxburgh's *R. cernua*, of which nothing is known but that the seeds came from Mysore, and Roxburgh's description and picture. In his description Roxburgh says the flowers were small, and his picture shows them  $\frac{2}{3}$  in. long, so that it must be a striking variety of the Parasnath plant.

6. **R. suffruticosa**, *Roxb. Fl. Ind.* iii. 53; leaves elliptic hairy not acuminate, bracteoles petioled elliptic leaf-like, sepals  $\frac{1}{4}$  in., corolla  $1\frac{1}{2}$  in. white. *T. Anders. in Journ. Linn. Soc.* ix. 461. *R. repens*, *Wall. Cat.* 2384, letter F only. *Dipteracanthus* Sibua, *Nees in Wall. Pl. As. Rar.* iii. 81, and in *DC. Prodr.* xi. 121.

BENGAL; Dinajpur, *Hamilton*; throughout CHOTA NAGPORE, alt. 1–2000 ft., *Clarke.* UPPER GANGETIC PLAIN; Moradabad, *Thomson.*

*Rootstock* woody; annual stems sometimes 1–3 in. only (especially after the fires), sometimes 1–2 ft. *Leaves* 4 by  $1\frac{1}{2}$  in., obtuse in the typical form, or acute hardly acuminate in Thomson's specimens. *Bracteoles*  $\frac{3}{4}$  in., hardly acute. *Sepals* linear, puberulous or glabrate. *Capsule*  $\frac{3}{4}$ –1 in.—Very closely allied to *R. cernua*.

7. **R. Beddomei**, *Clarke*; leaves elliptic acute hairy on both surfaces, bracteoles subpetioled ovate acute leaf-like, sepals  $\frac{1}{2}$  in., corolla 3 in. *R. cernua*, *Anders. in Journ. Linn. Soc.* ix. 460, partly, not of *Roxb.*

CENTRAL INDIA; Jubbulpore, *Beddome.*

This seems nearer *R. suffruticosa* than *R. cernua*, of which T. Anderson reckoned it a form; but it differs from both in the very large corolla, the lobes of which are 1 by  $\frac{3}{4}$  in., roundly elliptic.

8. **R. ciliata**, *Hornem. Hort. Hafn.* ii. 585; pubescent, leaves ovate shortly obtusely acuminate, bracteoles scarcely so long as the calyx-tube, corolla  $1\frac{1}{2}$  in. *T. Anders. in Journ. Linn. Soc.* xi. 120. *Dipteracanthus ciliatus*, *Wall. Cat.* 7151; *Nees in Wall. Pl. As. Rar.* iii. 81, and in *DC. Prodr.* xi. 120. *Larysacanthus ciliatus*, *Oerst. in Vidensk. Meddel. Kjobenh.* 1854, 123.

BURMA; Prome, *Wallich.*

*Stems* 2 ft., shortly pubescent upwards. *Leaves*  $3\frac{1}{2}$  by 2 in., base shortly cuneate, obscurely sinuate-crenulate; petiole  $\frac{1}{2}$ –1 in. *Bracteoles*  $\frac{1}{4}$ – $\frac{1}{3}$  in., oblong or spatulate-elliptic. *Calyx-tube*  $\frac{1}{3}$  in.; teeth  $\frac{1}{2}$  in., linear, pubescent. *Corolla* nearly glabrous, cylindric tubular much shorter than the ventricose part. *Filaments* hairy at the base. *Ovules* about 12. *Capsule* not seen.

9. **R. macrosiphon**, *Kurz in Journ. As. Soc.* 1873, pl. ii. 92; hairy, leaves linear-lanceolate or linear, bracteoles linear-lanceolate foliaceous, calyx-segments  $2\frac{1}{2}$  in. linear-subulate, corolla 2 in. *Ruellia* sp., *T. Anders. in Journ. Linn. Soc.* ix. 461.

PEGU; *Beddome.*

Perennial, 2–3 in., woolly with crisped white hairs. *Leaves* 2 in., entire, narrowed at both ends; petiole obscure. *Flowers* sessile, solitary; bracteoles  $\frac{1}{2}$  by  $\frac{1}{12}$  in., linear-



oblong, white-hirsute. *Sepals*  $\frac{1}{4}$  in., linear-lanceolate, glabrous, densely lineolate. *Corolla* pubescent; tube long-linear, ventricose for  $\frac{1}{3}$  its length. *Stamens* 4, subequal; anther-cells similar, parallel, minutely white-tailed. *Style* elongate, branches  $\frac{1}{20}$  in., subequal. *Capsule* many-seeded.—This recedes from the genus in the subequally bifid style; but the corolla-lobes are twisted in bud, and it must be a *Ruellia* or very near it.

## DOUBTFUL SPECIES.

R. ? INVOLUCRATA, *Vahl Symb.* iii. 83; leaves short-petioled lanceolate attenuate at both ends entire glabrous, spikes small ovoid hirsute, bracts ovate attenuate quadri-farious. *Nees in DC. Prodr.* xi. 150.

INDIA (Madras?); *Koenig*.

General aspect of *Justicia Gendarussa*. *Leaves* 6–8 by 1– $\frac{3}{4}$  in., shining, conspicuously lineolate above. *Spikes* as large as a hazel-nut; bracteoles linear, hairy, shorter than the bracts. *Calyx* as long as the bracts. *Corolla* hairy in the throat. *Anthers* subsagittate at base. *Style* simple lanceolate branch. *Ovary* “pluri-ovulate.”—Described by *Nees* from *Koenig*’s specimen. The number of the ovules uncertain, and it is impossible to guess the genus.

R. ? GLANDULOSA, *Roth Nov. Sp.* 312; shortly villous, leaves petioled ovate-lanceolate subserrate, racemes axillary short subsecund, bracts minute linear-subulate glandular-villous. *Nees in DC. Prodr.* xi. 153. *Ruellia glabra*, *Heyne*.

INDIA (Madras?); *Heyne*.

*Stem* 4-angled, geniculate. *Leaves* 1 in. or a little longer; petiole  $\frac{1}{6}$  in. *Racemes* nearly horizontal; peduncle solitary, shorter than the petiole, 5- or 6-fld.; bracts at the apex of the pedicels 2. *Sepals*  $\frac{1}{3}$  in., equal, linear-subulate, glandular-villous. *Corolla* scarcely longer than the calyx, unequal, pubescent.—The combination of minute bracts with a corolla hardly longer than the calyx has defeated all attempts to ascertain the genus of this plant.

XI. **ECHINACANTHUS**, *Nees*.

Erect herbs or undershrubs. *Leaves* opposite, ovate or oblong, acute-toothed. *Cymes* lax, short, few-fld., or long compound, axillary, upper forming a terminal panicle; pedicels short or 0; bracts small, linear; bracteoles small or 0. *Sepals* 5, long, linear, subequal. *Corolla* tubular-ventricose, nearly straight, widened about the middle; lobes 5, subequal, rounded, twisted to the left in bud. *Stamens* 4, didynamous, included; anthers sub-similar, 2-celled; cells oblong, parallel, base spurred or not. *Ovary* with 6–8 ovules in each cell; style linear, stigma simple linear. *Capsule* oblong-linear, 8–16-seeded nearly from the base; retinacula stout, hooked. *Seeds* compressed, discoid, densely hairy, the hairs starting out on applying water.—Species 5, all Indian.

The character of the genus has been here widened to include plants closely resembling *Echinacanthus* except that the anther-cells are muticous.

\* *Anther-cells spurred at the base.*

1. **E. attenuatus**, *Nees in Wall. Pl. As. Rar.* iii. 90, and in *DC. Prodr.* xi. 168; leaves oblong or ovate subdentate, sepals linear viscous-pubescent, corolla  $1\frac{1}{4}$  in. puberulous. *T. Anders. in Journ. Linn. Soc.* ix. 459. *Ruellia attenuata*, *Wall. Cat.* 2345; *Nees in Wall. Pl. As. Rar.* iii. 83 (not *Strobilanthes attenuatus*, *Nees in DC. Prodr.* xi. 193).

CENTRAL and EASTERN HIMALAYA; Nepal, *Wallich*; Tambur River, alt. 2–4000 ft., *J. D. H.* Sikkim, alt. 4000 ft., *Treutler, &c.*

*Stems* 1–2 ft., pubescent upwards. Lower leaves  $3\frac{1}{2}$  by 2 in., broadly elliptic;



middle cauline oblong, narrowed to both ends, upper  $1\frac{3}{4}$  by  $\frac{1}{6}$  in.; mature subsessile, glabrate, lineolate or obscurely pubescent. *Cymes* 1–2 in., viscous-pubescent, forming a quasi-panicle 6–8 in. long; bracts  $\frac{1}{4}$ – $\frac{1}{3}$  in., linear, secund, opposite, one barren, the other stipitate 0– $\frac{1}{2}$  in.; bracteoles 0. *Calyx-tube*  $\frac{1}{8}$ – $\frac{1}{6}$  in.; lobes  $\frac{1}{2}$  in. *Corolla* dark purple with lilac veins, cylindric equalling the ventricose portion. *Filaments* and *anthers* sparsely hairy. *Ovary* glabrous, style hairy. *Capsule*  $\frac{3}{4}$  in., oblong scarcely ventricose; solid cylindric portion scarcely  $\frac{1}{10}$  in.—(See 6, *E. Pumilio*.)

2. ***E. parviflorus***, *T. Anders. in Journ. Linn. Soc.* ix. 459; leaves ovate acuminate serrate, sepals linear glabrous, corolla 1– $1\frac{1}{4}$  in. glabrous.

KHASIA MTS.; *Griffith, Simons* (fide T. Anderson).

Glabrous, erect, divaricate. *Leaves* 3–6 by 2–3 in., base obliquely rounded; petiole 2–3 in. *Panicles* axillary and compound, terminal 6–10 in. long; flowers opposite, sessile; flowers often secund; bracts  $\frac{1}{2}$  in., linear; bracteoles minute. *Calyx* divided to the base. *Corolla* straight, thrice as long as the calyx, funnel-shaped portion thrice as long as the cylindric. *Capsule* compressed, 8-seeded; seeds small, compressed.—Not seen; the foregoing abstracted from T. Anderson.

3. ***E. Brugmansianus***, *Nees in DC. Prodr.* xi. 168; leaves oblong attenuate at both ends repand sub-crenate hirsute-tomentose.

INDIA? in Vahl's Herbarium (Nees).

Calyx-segments a little shorter and less attenuate than those of *E. attenuatus*.—Not seen; the foregoing copied from Nees.

\*\* *Anther-cells muticous at the base.*

4. ***E. Andersoni***, *Clarke*; leaves ovate acuminate mature glabrate, cymes lax large zigzag glabrous, corolla  $\frac{3}{4}$  in.—*Echinacanthus* sp., *T. Anders. ms.*

SIKKIM HIMALAYA; Darjeeling; Pomong, alt. 3000 ft., *Clarke*. KHASIA MTS.?; *Calcutta Herbarium*.

An undershrub, 3 ft.; young parts (at least sometimes) with dense snow-white wool. *Leaves*  $4\frac{1}{2}$  by  $2\frac{1}{2}$  in., base rounded, crenate-serrate, raphides obscure; petiole  $1\frac{1}{2}$  in. *Cymes* in terminal panicles 12 by 15 in., flowers all solitary, mostly opposite on the ultimate branches; pedicels  $\frac{1}{8}$  in.; bract at the base of the pedicel  $\frac{1}{2}$  in., linear; bracteoles  $\frac{1}{2}$  in., linear. *Calyx*  $\frac{1}{2}$  in. and upwards, narrow, glabrous or nearly so; segments long-linear acute, connate at base for  $\frac{1}{8}$ – $\frac{1}{6}$  in. *Corolla* nearly glabrous, blueish. Anterior *filaments* hairy at their base, sparsely so upwards; posterior filaments glabrous, anthers rather smaller. *Style* glabrous, stigma rather short. *Capsule* exceeding  $\frac{1}{2}$  in., narrowly-oblong, 12–16-seeded from the base. *Seeds* discoid; on applying water the hairs start out.—Habit and inflorescence of a sympodal *Strobilanthes*, but the capsule is many-seeded. The inflorescence differs from that of *E. attenuatus* in that, of the 2 flowers in the axils of opposite bracts, one is not usually obsolete.

VAR. *viscosa*; panicle and sepals viscous-pubescent, corolla  $\frac{1}{2}$  in. pubescent.—Sikkim, alt. 4000 ft.; Lingcham, *Clarke*.

5. ***E. longistylus***, *Clarke*; leaves ovate acuminate mature nearly glabrate, cymes lax large zigzag viscous-pubescent, corolla  $1\frac{1}{2}$  in.

SIKKIM HIMALAYA, alt. 1–4000 ft.; Punkabari and Kursiong, *Clarke*.

Closely resembling the viscous-pubescent Var. of *E. Andersoni*, but the corolla very much larger. *Style* hairy, thickened upwards, stigma linear-lanceolate (resembling the pistil of *Æchmanthera*. *Seeds* 8–12 to the capsule, the hairs on them starting out when wetted.—The position of this and of *E. Andersoni* is doubtful between *Strobilanthes* and *Echinacanthus*.

6. ***E. Pumilio***, *Clarke*; finely glandular-pubescent, leaves small



elliptic crenate or toothed, cymes lax compound zigzag pubescent, corolla  $\frac{2}{3}$  in.

KHASIA MTS., alt. 4200 ft.; Cherra Coal-hill, *Clarke*.

An undershrub, 6–15 in., very woody, much branched, densely covered on all sides with cymes. *Leaves* 1 by  $\frac{1}{2}$  in., narrowed at both ends (many  $\frac{1}{4}$ – $\frac{1}{2}$  in. ovate), blackish; hairs scattered, very fine, often gland-tipped; petiole  $\frac{1}{2}$  in. *Cymes* as of *E. Andersoni*; bracts  $\frac{1}{4}$  in., linear; pedicels often  $\frac{1}{8}$  in.; bracteoles  $\frac{1}{8}$ – $\frac{1}{6}$  in., linear. *Sepals*  $\frac{1}{3}$  in., linear, finely glandular-pubescent. *Corolla* light-purple, nearly glabrous. *Filaments* glabrous except near the base, where they are shortly connate; anthers subequal, 2-celled; cells oblong, muticous, connective not excurrent. *Ovary* glabrous; style very sparsely hairy, stigma long narrowly lanceolate; ovules 3 in each cell. *Capsule* not seen.—This may prove to be *E. parviflorus*, T. Anders., but it is not likely that T. Anderson would have put that species in *Echinacanthus* without remark, had the anther-cells been muticous.

## XII. PETALIDIUM, Nees.

Minutely hairy undershrubs. *Leaves* ovate or narrowly oblong, entire or toothed. *Flowers* sessile or nearly so, solitary, usually crowded on abbreviated lateral branches; bracts 0; bracteoles large, ovate, reticulate-nerved becoming scarious. *Sepals* subequal, linear-lanceolate. *Corolla-tube* straight, ventricose nearly from the base; lobes rounded, twisted to the left in bud, patent in flower. *Stamens* 4, didynamous; anthers subsimilar, 2-celled; cells parallel, spurred at the base. *Ovary* with 2 ovules in each cell; style long-linear, stigma unequally 2-lobed. *Capsule* clavate, compressed parallel to the septum, 2- or 4-seeded; placentæ dehiscing elastically from the bottom of the capsule, raising the discoid seeds with them.—Species 12, one Indian, the rest African.

The above character is drawn chiefly from the Indian species; the number of African species received since the Gen. Pl., vol. ii., pl. 2, was published, may necessitate widening of the generic character.

**P. barlerioides**, Nees in *Wall. Pl. As. Rar.* iii. 82, and in *DC. Prodr.* xi. 114, excl. syn. *Eranthemum barlerioides*, *Roxb.*; leaves ovate crenate, bracteoles  $\frac{3}{4}$  in., corolla 1 in. *Bot. Mag.* t. 4053; *Dalz. & Gibs. Bomb. Fl.* 185; *T. Anders. in Journ. Linn. Soc.* ix. 461. *Ruellia barlerioides*, *Roth Nov. Sp.* 310; *Wall. Cat.* 2389. *R. bracteata*, *Roxb. Fl. Ind.* iii. 47.

N.W. HIMALAYA and N. DECCAN PENINSULA, alt. 1–3000 ft.; extending from Canara and the Concan to Rajmahl and Rajpootana, frequent; reappearing in the OUDE and KUMAON dry Terai, alt. 1500 ft.

*Stems* several, 2–3 ft., terete. *Leaves* 2–4 in., acuminate, hoary or dusky puberulous; petiole  $\frac{1}{8}$ – $\frac{1}{2}$  in.; leaves on the shortened flower-bearing spurs  $\frac{1}{2}$ –1 in. *Bracteoles* ovate or elliptic, acute. *Sepals*  $\frac{1}{3}$  in., linear, puberulous or pubescent. *Corolla* narrow-campanulate, pale-blue or white, yellow-tinged; palate with long deflexed fulvous hairs within. *Filaments* and *anthers* minutely sparsely hairy (all but glabrous). *Ovary* glandular upwards, style shortly hairy. *Capsule*  $\frac{1}{2}$  in., usually 2-seeded. *Seeds* shaggy, hairs somewhat elastic when wetted; retinacula (with the placentæ) stout, rigid.—*Eranthemum barlerioides*, *Roxb.*, placed here by Nees (and T. Anderson), is either *Eranthemum Parishii* or very near it, and came from the Andamans.

## XIII. PHAYLOPSIS, Willd.

Prostrate, perennial herbs. *Leaves* opposite, petioled, ovate, entire or obscurely crenate. *Spikes* terminal, 1-sided, dense; bracts orbicular, closely



imbricate, each usually 3-fld.; bracteoles 0. *Sepals* 5, one ovate, nervose, the others linear like bracts. *Corolla* small; tube slender, cylindric; lobes 5, slightly unequal, rounded, contorted in the bud, patent in flower. *Stamens* 4, didynamous; anthers subsimilar, 2-celled; cells parallel, shortly oblong, base minutely mucronate. *Ovary-cells* 2-ovuled; style long-linear, hairy, stigma simple linear. *Capsule* clavate, compressed parallel to the septum, 4-seeded; placentæ dehiscing elastically from the base of the capsule, raising the seeds with them. *Seeds* compressed, discoid, densely elastically white-hairy when wetted.—Species 10, all Tropical and African, one Indian and one Arabian.

**P. parviflora**, Willd. *Sp. Pl.* iii. 342; hairy, leaves opposite unequal ovate, bracts orbicular or reniform membranous becoming in fruit whitened nervose. *T. Anders. in Journ. Linn. Soc.* ix. 461. *Micranthus oppositifolius*, Wendl. *Obs.* 39. *Ruellia imbricata*, Vahl *Symb.* ii. 73; *Roxb. Fl. Ind.* iii. 48; *Wall. Cat.* 2353. *R. dorsiflora*, Retz. *Obs.* vi. 31. *Ætheilema reniforme*, Nees in *Wall. Pl. As. Rar.* iii. 94, and in *DC. Prodr.* xi. 261; *Wight Ic.* t. 1533; *Dalz. & Gibs. Bomb. Fl.* 192. *Æ. parviflorum*, Spreng. *Syst.* ii. 826. *Æ. mucronata?* Griff. *Notul.* iv. 137.—*Ætheilema*, Griff. *Notul.* iv. 136.

Throughout INDIA (except the N.W.), alt. 0–3000 ft., from the Himalaya to CEYLON and Tenasserim; common in Bengal both in the plains and in the lower hills.—DISTRIB. Madagascar, Tropical Africa.

A prostrate, closely-branched herb; branches often flagellate, 2–3 ft. *Leaves*  $3\frac{1}{2}$  by  $1\frac{1}{2}$  in., acuminate at both ends, obscurely pubescent, petiole  $\frac{1}{2}$  by  $1\frac{1}{4}$  in.; leaves of lateral branches  $\frac{1}{2}$ – $1\frac{1}{2}$  in. *Spikes*  $\frac{1}{4}$ –2 in., densely or thinly hairy; bracts  $\frac{1}{4}$ – $\frac{1}{3}$  in. *Calyx*  $\frac{1}{4}$  in., hairy. *Corolla*  $\frac{1}{2}$  in., nearly white. *Stamens* glabrous. *Capsule*  $\frac{1}{4}$  in.; valves with rigid backs and scarious sides. *Seeds*  $\frac{1}{18}$  in. diam.

#### XIV. **DÆDALACANTHUS**, T. Anders.

Shrubs or perennial herbs. *Leaves* opposite, petioled, entire or obscurely toothed, lineolate by raphides. *Spikes* linear with distant flowers, or dense or capitate; bracts usually large; bracteoles linear-lanceolate, hardly so long as the calyx. *Corolla-tube* linear, long, widened only near the top or in a few species from the middle; lobes obovate, twisted to the left in bud, horizontal in flower, blue, rarely rose, veined. *Stamens* 2, glabrous; anthers narrowly oblong, 2-celled, muticous, exserted or subincluded. *Ovary* glabrous, 4-ovuled; style long, sparingly hairy, stigma simple linear. *Capsule* clavate, base solid cylindric. *Seeds* normally 4, compressed, discoid, densely finely elastically hairy when wetted.—Species 17, Indian and Malayan.

This genus, in the long corolla and 2 stamens with muticous anthers, greatly simulates *Eranthemum*; the species are in general easily distinguished by the bracts much exceeding the calyx; in *D. microstachyus* & *concanensis*, however, the bracts are small, and they can only be recognized by their twisted corolla-lobes.

\* *Corolla lower half cylindric, upper half ventricose or funnel-shaped.*

1. **D. tubiflorus**, T. Anders. in *Journ. Linn. Soc.* ix. 485; leaves elliptic acuminate at both ends glabrate, spikes axillary simple dense, corolla  $1\frac{3}{4}$  in. upper half ventricose.

E. BENGAL (? Mishmee); Griffith (Kew Distrib. n. 6122).

*Stem* upwards and innovations pubescent. *Leaves*  $8\frac{1}{2}$  by 3 in., obscurely crenulate, lineolate with raphides on both surfaces; nerves 12 pair; petiole 1 in. *Spikes*



3 in., short-peduncled; bracts  $\frac{2}{3}$  in., closely imbricate, 1-fl., obovate, shortly acute, glabrous, white with green reticulating nerves; bracteoles  $\frac{1}{4}$  in., lanceolate, acuminate. *Calyx* nearly  $\frac{1}{3}$  in., divided  $\frac{2}{3}$  the way to the base; lobes lanceolate, acuminate, puberulous. *Corolla* slightly curved, glabrate; lobes  $\frac{1}{3}$  by  $\frac{1}{2}$  in., roundly elliptic, nervose. *Stamens* glabrous; anthers exserted. *Capsule* not seen.

2. **D. Griffithii**, *T. Anders. in Journ. Linn. Soc.* ix. 486; leaves oblong or elliptic acuminate at both ends glabrate, spikes long-peduncled simple dense, corolla  $1\frac{1}{4}$  in. upper half funnel-shaped.—*Eranthemum* sp., *Griff. Itin. Notes*, 96, n. 1437.

BHUTAN; Ghoorgong, *Griffith* (Kew Distrib. n. 6126).

*Branchlets* upwards tetragonous, obscurely pubescent. *Leaves* 6 by 2 in., lineolate with raphides on both surfaces; nerves 9 pair; petiole  $\frac{3}{4}$  in. *Peduncles* 3–4 in., 4-angled; spikes 2–5 in.; bracts 1 in., densely imbricated, 1-fl., ovate, acuminate, glabrous, whiteish with green reticulating nerves; bracteoles  $\frac{1}{4}$  in., linear-lanceolate. *Calyx*  $\frac{1}{4}$ – $\frac{1}{3}$  in., divided more than half-way down; lobes linear-lanceolate, minutely puberulous. *Corolla* slightly curved, flesh-coloured without, rose within (*Griffith*), nearly glabrous, narrower at the summit and less suddenly narrowed in the middle than that of *D. tubiflorus*. *Stamens* glabrous; anthers exserted. *Capsule*  $\frac{1}{2}$  in., glabrous. *Seeds*  $\frac{1}{8}$ – $\frac{1}{6}$  in.—Seems very near *D. tubiflorus*.

3. **D. splendens**, *T. Anders. in Journ. Linn. Soc.* ix. 486; leaves ovate or elliptic acuminate at both ends somewhat pubescent, spikes short-peduncled usually very long, corolla  $1\frac{1}{2}$  in. pubescent upper half of the tube funnel-shaped.—*Eranthemum* sp. n. 23, *Herb. Ind. Or. H. f. & T.*

SIKKIM HIMALAYA; alt. 1–3000 ft., frequent; *Griffith* (Kew Distrib. n. 6129), *J. D. H.*, &c.

*Stems* 3–5 ft., pubescent upwards. *Leaves* 6 by 3 in., subentire, lineolate with raphides on both surfaces; nerves 12 pair; petiole  $\frac{1}{2}$ – $1\frac{1}{2}$  in. *Peduncles*  $\frac{1}{2}$ – $1\frac{1}{2}$  in.; spikes 3–12 in.; bracts  $\frac{3}{4}$  in., all imbricate, 1-fl., obovate, glandular-pubescent, whiteish or brownish with reticulated green nerves; bracteoles  $\frac{1}{4}$  in., linear-lanceolate. *Calyx*  $\frac{1}{3}$  in., lobed half-way down; lobes narrow-lanceolate, puberulous. *Corolla* slightly curved, brick-red; lobes  $\frac{1}{3}$  in., roundly elliptic, patent or recurved in flower. *Stamens* glabrous, anthers exserted. *Capsule*  $\frac{3}{4}$  in., thinly glandular-pubescent.—Near *D. tubiflorus*.

\*\* *Corolla-tube* cylindric, widened below the summit for scarce  $\frac{1}{3}$  its length.

4. **D. nervosus**, *T. Anders. in Journ. Linn. Soc.* ix. 487; leaves ovate acuminate glabrous lineolate, base shortly attenuate, spikes short uninterrupted, bracts elliptic subobtusate or shortly acuminate nervose glabrate margins entire incurved not ciliate, corolla  $1\frac{1}{4}$  in. blue glabrous. *Justicia nervosa*, *Vahl Enum.* i. 164; *Bot. Mag.* t. 1358. *Ruellia varians*, *Vent. Jard. Cels.* t. 46. *Eranthemum nervosum*, *Br. Prodr.* 477; *Nees in Wall. Pl. As. Rar.* iii. 106, and in *DC. Prodr.* xi. 445; *Wall. Cat.* 2493, in chief. *E. pulchellum*, *Andr. Bot. Repos.* t. 88, not of *Roxb.* *E. Edgeworthianum*, *Nees in DC. Prodr.* xi. 446.

Base of the HIMALAYA, alt. 1–3000 ft., from the Punjab to Bhotan, frequent. SILHET; *Wallich*. SOONDERBUND; *Clarke*.—(Cultivated in various tropical countries.)

*Stems* 2–6 ft., glabrous, or very nearly so to the summit. *Leaves* often 8 by 4 in., entire or obscurely crenulate, upper shortly attenuate at the base, raphides copious on both surfaces; nerves 10 pair; petiole  $\frac{1}{2}$ – $1\frac{1}{2}$  in. *Spikes* 1–3 in., often ternate, forming close terminal panicles; peduncles  $\frac{1}{2}$ – $1\frac{1}{2}$  in., often acutely quadrangular, lineolate, glabrous or obscurely pubescent; bracts  $\frac{1}{2}$  in., much more concave than in the neighbouring species, imbricated deeply but somewhat laxly, sometimes obtuse never



long-acuminate, lineolate, puberulous; bracteoles  $\frac{1}{2}$  in., narrowly lanceolate. *Calyx*  $\frac{1}{4}$  in., lobed half-way down, whiteish, minutely but densely pubescent; lobes lanceolate. *Corolla-lobes*  $\frac{1}{4}$ – $\frac{1}{2}$  in., broadly elliptic. *Stamens* glabrous; anthers exserted, narrowly oblong. *Ovary* glabrous; style nearly glabrous. *Capsule*  $\frac{1}{2}$  in.; solid cylindric base short. *Seeds*  $\frac{1}{8}$  in. diam.—The Soonderbund plant has the calyx-lobes unusually short. The Var. *scabra* of Nees is merely a specimen in young flower, and therefore slightly scabrid-puberulous (it is not Anderson's *scabra*).

5. **D. macrophyllus**, *T. Anders. in Journ. Linn. Soc.* ix. 487; stem pubescent upwards, leaves elliptic-lanceolate ovate acuminate attenuate at the base often obscurely scabrid-puberulous, spikes linear subinterrupted, bracts elliptic subobtusely nervose margins entire obscurely pubescent not ciliate, corolla  $1\frac{1}{4}$  in. *Bot. Mag.* t. 6686. *Eranthemum macrophyllum*, *Wall. Cat.* 7179; *Nees in Wall. Pl. As. Rar.* iii. 106, and in *DC. Prodr.* xi. 446.

PEGU, BURMA and TENASSERIM; *Wallich, &c.* (Kew Distrib. n. 6128).

Closely allied to *D. nervosus*, but the inflorescence more lax. *Leaves* similar to (not larger than) those of *D. nervosus*, but (even when mature) often with scattered minute hairs on the upper surface, and a scabrid pubescence on the nerves beneath; raphides fewer and less prominent. *Peduncles* 2–5 in., pubescent; spikes 2–5 in.; bracts as of *D. nervosus*, the lower often scarcely overlapping.—A single specimen of this from Hort. Kew put into the Herbarium in 1869 is marked *D. scaber* by T. Anderson, but is not the plant so called of his monograph in *Journ. Linn. Soc.*, which is a *D. nervosus*.

6. **D. strictus**, *T. Anders. in Journ. Linn. Soc.* ix. 487; leaves ovate or elliptic narrowed at both ends glabrous or nearly so, spikes linear interrupted forming a large terminal panicle, bracts narrowly elliptic obtuse herbaceous not whitened, corolla  $1\frac{1}{4}$ –2 in. blue. *Eranthemum strictum*, *Colebr.*; *Roxb. Fl. Ind. ed. Carey*, and *Wall.* i. 114; *Wall. Cat.* 2494; *Bot. Reg.* t. 867; *Bot. Mag.* t. 3068; *Nees in Wall. Pl. As. Rar.* iii. 106, and in *DC. Prodr.* xi. 448 (excl. syn. *Wall. Cat.* 2492 a.).

EASTERN FRONTIER, in the lower hills, alt. 0–3000 ft., from KHASIA MTS. to CHITTAGONG, *Wallich, H. f. & T., &c.*, frequent.

A herb, 1–3 ft., with large basal leaves, pubescent, sparingly leafy upwards. Basal leaves 6–12 in., narrowed at the base, short-petioled, subentire, raphides obscure; upper often 1–2 in. only, base sometimes rounded. *Spikes* 3–8 in., hairy in the Chittagong plants, nearly glabrous in some of the Khasian; bracts  $\frac{1}{2}$ –1 in., much exceeding the calyx, green, 1-fld.; bracteoles  $\frac{1}{2}$  in., linear-lanceolate. *Calyx*  $\frac{1}{2}$  in., divided half-way down; lobes lanceolate. *Corolla* often pubescent. *Stamens* glabrous; anthers included. *Style* hairy in the Chittagong specimens, very slightly so in the Khasian. *Capsule*  $\frac{1}{2}$ – $\frac{3}{4}$  in., glandular-pubescent, or in the Khasian examples nearly glabrous.

7. **D. roseus**, *T. Anders. in Journ. Linn. Soc.* ix. 487; leaves elliptic acuminate at both ends glabrous lineolate, spikes linear subinterrupted, bracts obovate with a short recurved mucro glandular-pubescent strongly nerved, corolla 1– $1\frac{1}{2}$  in. rose subglabrous. *Justicia rosea*, *Vahl Enum.* i. 165. *Eranthemum roseum*, *Br. Prodr.* 447; *Nees in DC. Prodr.* xi. 447; *Dalz. & Gibs. Bomb. Fl.* 195.

W. and S. DECCAN PENINSULA, from the Bombay Ghats to Mangalore, frequent; *Wight, Hohenacker, &c.*

Resembling *D. nervosus*, but inflorescence more lax and bracts different. *Peduncles* 0–2 in., axillary and terminal; spikes often 6 in. *Bracts* (all but the lowest) imbricated,  $\frac{1}{2}$ – $\frac{3}{4}$  in., strongly rugose by raised inarching green nerves; margins entire, glabrous, ciliate or very hairy. *Seeds*  $\frac{1}{8}$  in. diam., much compressed. Otherwise (except the colour of corolla) as *D. nervosus*.



VAR. *Neesii*; leaves ovate acuminate not lineolate, nerves much raised beneath scabrous, spikes short dense, bracts ciliate.—ASSAM?

8. **D. tetragonus**, *T. Anders. in Journ. Linn. Soc.* ix. 488; leaves lanceolate acuminate at both ends glabrous densely lineolate, spikes solitary short-peduncled oblong very dense, bracts elliptic green long-ciliate, corolla  $1\frac{1}{2}$  in. pale blue. *Eranthemum tetragonum*, *Wall. Cat.* 7180; *Nees in Wall. Pl. As. Rar.* iii. 106, and in *DC. Prodr.* xi. 447.

BRITISH BURMA, *Wallich*; Moulmein, *Parish*; Thoungyen Hills, *Beddome*; Beeling Forest, *Brandis*.

*Branches* upwards slender, quadrangular, nearly glabrous. *Leaves*  $7\frac{1}{2}$  by  $1\frac{1}{4}$  in., much attenuate, subentire; nerves 7–8 pair; petiole 1 in. *Spikes* 2 in., hairy; bracts  $\frac{2}{3}$  by  $\frac{1}{3}$  in., subobtus. *Calyx* and *bracteoles* as of *D. nervosus*. *Corolla-tube* glabrous; mouth  $\frac{3}{4}$ –1 in. *Anthers* not exerted. *Capsule*  $\frac{1}{3}$  in.; solid narrowed base scarcely  $\frac{1}{8}$  in.—Not nearly allied to *Eranthemum salaccense* (Blume Bijl. 792), as T. Anderson supposed; Kurz erroneously reduced it thereto in *Journ. As. Soc.* 1870, pt. ii. p. 78.

9. **D. suffruticosus**, *T. Anders. in Journ. Linn. Soc.* ix. 488; leaves elliptic narrowed at both ends glabrate not lineolate, spikes short dense nearly glabrous, bracts obovate nervose not whitened, corolla  $1\frac{1}{4}$  in. pale blue. *Eranthemum suffruticosum*, *Roxb. Fl. Ind.* i. 111; *Nees in Wall. Pl. As. Rar.* iii. 107, and in *DC. Prodr.* xi. 448. *E. barlerioides*, *Roxb. Fl. Ind.* i. 113. *E. amœnum*, *Ham. ms.*

ANDAMANS; *Herb. Hamilton, Kurz*.

Nearly glabrous; branches leafy, obscurely tetragonous. *Leaves* 6 by  $2\frac{1}{4}$  in., undulate; nerves 6 pair; petiole  $\frac{2}{3}$  in. *Spikes* 1– $1\frac{1}{2}$  in., terminal, solitary, dense with (in Roxburgh's drawing) sometimes a few straggling flowers at the base; bracts  $\frac{3}{4}$  in., obtuse with a short mucro, glabrous; nerves prominent beneath; bracteoles  $\frac{1}{4}$  in., linear-lanceolate. *Calyx*  $\frac{1}{4}$  in., divided half-way down; lobes linear-lanceolate. *Corolla-tube* glabrous; mouth  $\frac{3}{4}$  in. diam. *Anthers* included.—*E. barlericoides*, somewhat doubtfully referred here by T. Anderson, is merely one of the cases where Roxburgh changed the name of a species, and his editors Wallich and Carey printed the description twice over.

10. **D. microstachyus**, *T. Anders. in Journ. Linn. Soc.* ix. 488; leaves elliptic narrowed at both ends glabrate, flowers remote sessile paniced, bracts small none imbricate, corolla  $1\frac{1}{2}$  in. purple.

MOULMEIN; *Lobb*.

A herb, 2–3 ft., with large basal leaves, sparingly leafy upwards, habit of *D. strictus*. *Leaves* 8 by 3 in., base attenuate or rounded, subentire, obscurely or not lineolate; nerves 10 pair; petiole 0–1 in. *Panicle* large, compound, trichotomous, glandular-pubescent, branches quadrangular; bracts  $\frac{1}{3}$  in., ovate or elliptic; bracteoles  $\frac{1}{6}$  in., oblong. *Calyx*  $\frac{1}{3}$  in., deeply divided, green; lobes linear, viscid-pubescent. *Corolla-mouth*  $1\frac{1}{4}$  in. diam. *Anthers* included. *Ovary* and *style* somewhat glandular-pubescent. *Capsule*  $\frac{3}{4}$  in., acute; solid cylindric base longer than the seed-bearing part.—Though the shortened bracts give this so different an aspect, the species appears very closely allied to *D. strictus*.

11. **D. purpurascens**, *T. Anders. in Journ. Linn. Soc.* ix. 488; leaves ovate acuminate upper often rounded at the base, spikes solitary oblong very dense, bracts ovate much acuminate nervose ciliate. *Justicia pulchella*, *Roxb. Cor. Pl.* ii. 41, t. 177. *Eranthemum pulchellum*, *Roxb. Fl. Ind.* i. 111, not of Andr. *E. purpurascens*, *Nees in Wall. Pl. As. Rar.* iii. 106, and in *DC. Prodr.* xi. 447. *E. montanum*, *Wall. Cat.* 2492, partly. *E.*



nervosum, *Dalz. & Gibs. Bomb. Fl.* 195, not of others.—*Eranthemum* sp. n. 12, *Herb. Ind. Or. H. f. & T.*

CENTRAL INDIA, alt. 1–4000 ft., common; from the Bombay Ghats, *Jacquemont*, and Belgaum, *Ritchie*, to Parasnath and South Behar, *J. D. H.* UPPER ASSAM; Dibroo-mook, *Griffith*.

Stems 2–4 ft., leafy. Leaves attaining 9 by 4 in., base decurrent, uppermost much smaller, subsessile, often cordate, subentire, sometimes glabrate, densely lineolate, sometimes pubescent on the nerves on both surfaces (the raphides in such case obscure); nerves 7–9 pair. Spikes 1–2½ in., usually appearing long-peduncled, the uppermost leaves being much reduced; bracts 1 in., base rounded, rigid, green not whitened but with much elevated nerves, apex divaricate, margins not incurved; bracteoles ½ in., linear-lanceolate. Calyx ¼ in., lobed half-way down; segments lanceolate, whitened, minutely pubescent. Corolla 1½ in., blueish, pubescent or nearly glabrous. Anthers included. Capsule ½–⅔ in., lower solid cylindric portion short.—The bracts in *Roxb. Cor. Pl.* t. 177 are characteristically those of *D. purpurascens*, and in the description he says bracts ciliate. Moreover *Roxburgh* got his *E. pulchellum* from “the drier parts of India.”

12. **D. montanus**, *T. Anders. in Thwaites Enum.* 229, and in *Journ. Linn. Soc.* ix. 489; leaves elliptic attenuate at both ends subglabrous lineolate, spikes linear or capitate viscidly hairy, bracts lanceolate linear-acuminate green, calyx deeply divided segments linear green glandular hairy, corolla 1¾ in. blue. *Eranthemum capense*, *Linn. Amæn. Acad.* i. 385. *E. montanum*, *Roxb. Fl. Ind.* i. 110; *Wall. Cat.* 2492; *Nees in Wall. Pl. As. Rar.* iii. 107, and in *DC. Prodr.* xi. 448 (excl. syn. *Bot. Mag.* t. 4031); *Wight Ic.* t. 466; *Dalz. & Gibs. Bomb. Fl.* 195. *E. fastigiatum*, *Spreng. Syst.* i. 89. *Justicia fastigiata*, *Lamk. Ill.* i. 41. *J. montana*, *Roxb. Cor. Pl.* ii. 41, t. 176.

W. and S. DECCAN and CEYLON, alt. 1–6000 ft., frequent; *Wallich*, *Wight*, &c.

Herb 2–3 ft., leafy; upper branches or peduncles quadrangular, usually white-hairy or glandular. Leaves 4½ by 1¾ in., all (except the floral) gradually attenuate at the base; nerves 6–7 pair; petiole ½–1½ in. Inflorescence extremely variable; from linear elongate spikes in compound corymbs or panicles with distant flowers to distant short-oblong very dense heads, always more or less glandular-hairy; bracts from elliptic with linear tips to linear-lanceolate, apex subobtusely, viscid-pubescent not whitened, lowest often 2-fld., bracts usually narrower in the elongate spikes broader in the shortened; bracteoles ½ in. Calyx ¼ in. Corolla 1½ in., pale blue. Anthers subexserted from the corolla-tube. Capsule ½–1 in. Seeds ⅓ in. diam.—A variable species best distinguished by the long linear green viscidly hairy calyx-teeth. The high-level form with shortened spikes hardly differs from *D. purpurascens* by any other character than this. The Javan *D. salaccensis* does not much differ but by the bracts being obscurely linear-spathulate upwards.

VAR. *Wightiana*; leaves large ovate, corymb very compound with linear branches, bracts linear, calyx and capsule small. *Eranthemum Wightianum*, *Wall. Cat.* 2495, letter A only; *Nees in Wall. Pl. As. Rar.* iii. 107, and in *DC. Prodr.* xi. 449.—Deccan Peninsula?, *Russell*.—This is a remarkable specimen, estimated a species by *Nees*; it seems that *T. Anderson* never saw it; the remainder of *Wall. Cat.* 2495 with distant capitate heads being that which *T. Anders.* reduced to a Var. of *D. montana*. In *Russell's* plant the leaves are 7 by 3½ in., shortly suddenly attenuate at the base, the uppermost subcordate; the bracts are exactly linear, parallel-sided (in *D. montanus* they are always dilated downwards); the corolla is not fully expanded, but seems smaller than in *D. montanus*.

VAR. *concanensis*, *T. Anders. ms.*; panicle compound, spikes linear interrupted, bracts ovate abbreviated, not rarely 2-fld.—*Concan*; *Law*.

13. **D. Parishii**, *T. Anders. in Journ. Linn. Soc.* ix. 489; leaves ovate or elliptic acuminate at both ends undulate-crenate glabrous, spikes sub-



capitate or oblong dense, bracts leaf-like glabrous often undulate-crenate, corolla  $1\frac{1}{2}$  in. blue.

MALAY PENINSULA; Tenasserim, *Helper* (Kew Distrib. n. 6176), *Beddome*; Tavoy and Moulmein, *Parish*.

Whole plant lineolate with raphides. *Stems* erect, elongate, tetragonous, leafy upwards. *Leaves*  $5\frac{1}{2}$  by  $2\frac{1}{2}$  in., tip long acuminate, base shortly acuminate; nerves 7-8 pair; petiole 0- $1\frac{1}{2}$  in. *Flowers* often appearing densely clustered at the nodes on shortened axillary spurs; bracts  $1-1\frac{3}{4}$  in., leafy, imbricated usually densely sometimes laxly; bracteoles  $\frac{1}{2}$  in., linear-lanceolate. *Calyx*  $\frac{1}{2}$  in., divided half-way down; lobes narrow-lanceolate, whitened, puberulous. *Corolla-limb*  $\frac{3}{4}$  in. diam. *Anthers* included. *Capsule* 1 in., glabrous.—This much resembles *D. suffruticosus*, but the leaves are conspicuously lineolate. T. Anderson has overlooked the true bracteoles; they are exactly similar in size, form and situation to those of other species. The bracts (bracteoles of T. Anders.) are 1 to each flower; when they are opposite on the spike and the flower in the axil of one is aborted, they appear superficially 2 to each flower; as is the case often in *D. montanus* and several other species and genera.

### XV. HEMIGRAPHIS, Nees.

Herbs or shrubs. *Leaves* opposite, toothed or subentire. *Flowers* sessile, in heads or spikes, rarely solitary; heads terminal or quasi-axillary on shortened branchlets, rarely (in *H. flava*) paniced; bracts imbricated, large, 1-fld.; bracteoles small, narrow, or 0. *Calyx* 5-partite nearly to the base; segments 5, subequal, linear-lanceolate or lanceolate. *Corolla* long-tubular, lower half cylindric, upper funnel-shaped or ventricose; lobes 5, rounded, subequal, sinistrosely contorted, blue or yellow. *Stamens* 4, didynamous, included or nearly so; anthers oblong, 2-celled, muticous, sometimes triangular, bases acute. *Style* long, stigma of one linear and one very short lobe; ovules 3-8 in each cell. *Capsule* linear or linear-oblong, 6-20-seeded nearly from the base. *Seeds* compressed, discoid, brown when dry, apparently glabrous with a white margin, when wetted densely hairy with white long unicellular hairs, each with numerous annular thickenings.—Species 20, Indian, Malayan, a few Chinese and Japanese.

Sect. 1. *Corolla* tubular-ventricose, limb blue. Longer *filaments* glabrous in their upper half or very nearly so.

1. **H. dura**, T. Anders. in *Journ. Linn. Soc.* ix. 461 (*excl. syn.* *Ruellia crispa*); bristly, leaves spathulate-elliptic crenate, bracteoles 0, calyx  $\frac{1}{2}$  in. subscarious. *Ruellia urens*, Heyne in *Herb. Rottler*; Roth Nov. Sp. 302; Roxb. Ic. Ined. *R. dura*, Nees in DC. Prodr. xi. 146; Dalz. & Gibs. Bomb. Fl. 186.

DECCAN PENINSULA; Kurnool (in Madras), *Beddome*; Bombay, *Jacquemont*; Central India, *Edgeworth*; Belgaum, *Ritchie*; Nilgherries, *Hohenacker*, &c.

*Stems* 1-2 ft., branched, diffuse, often almost prickly from white deflexed bristles. *Leaves*  $1\frac{3}{4}$  by  $\frac{2}{3}$  in., obtuse, harshly scabrous; petiole  $\frac{1}{4}$  in. *Heads* many-fld., with white and often much brown hair; bracts  $\frac{3}{4}$  in., oblong or spathulate. *Calyx* divided nearly to the base; segments linear, green with scarious margins, setulose. *Corolla*  $\frac{2}{3}$  in., subequal, blueish-purple, ventricose portion about as long as the cylindric. Longer *filaments* laxly hairy below. *Capsule*  $\frac{1}{2}$  in., 6-8-seeded.—Nees erroneously maintains (DC. Prodr. xi. 146) that *R. urens* of Heyne, Roth and Roxburgh is the same as their *R. latebrosa*.

2. **H. hirta**, T. Anders. in *Journ. Linn. Soc.* ix. 462; softly hirsute, leaves small ovate crenate, bracteoles 0, calyx  $\frac{1}{3}$  in. green. *Ruellia hirta*, Vahl



*Symb.* iii. 84, t. 67; *Roxb. Fl. Ind.* iii. 46; *Nees in DC. Prodr.* xi. 145, excl. *Var. β.* *R. latebrosa*, *Roxb. Fl. Ind.* iii. 46?; *Wall. Cat.* 2382, not of *Roth* nor of *Dalz.* nor of *Wight.* *R. sarmentosa*, *Nees in Wall. Pl. As. Rar.* iii. 83.

BENGAL; very common. UPPER GANGETIC PLAIN; Moradabad, *Thomson.*

Hirsute (not harshly) with white hairs. *Stems* 6–18 in., creeping in grass. *Leaves*  $\frac{1}{2}$ –1 in., obtuse; petiole 0– $\frac{1}{2}$  in. *Heads* 2–6-fld.; axillary solitary flowers not rarely added; bracts  $\frac{1}{2}$  in., elliptic. *Sepals* linear, or in fruit subspathulate. *Corolla*  $\frac{1}{2}$  in., subequal, pale lavender-blue, fugacious, glabrous with 2 hairy lines in the palate; ventricose portion nearly as long as the cylindric. Longer *filaments* laxly hairy below. *Style* sparsely hairy. *Capsule*  $\frac{1}{3}$  in., 12-seeded.—It is doubtful whether Roxburgh described this species under two names, or whether one of these applied to *H. venosa* or some other species. *Kurz (Journ. As. Soc.* 1871, ii. 74) proposed (unhappily) to unite this with *Ruellia Blumeana*.

3. ***H. venosa***, *Clarke*; scabrid-pubescent, leaves petioled ovate crenate, bracteoles as long as the calyx. *Ruellia venosa*, *Heyne in Herb. Rottler.* *R. crispa*, *Nees in Wall. Pl. As. Rar.* iii. 83, and in *DC. Prodr.* xi. 146, not of *Linn.*

DECCAN PENINSULA; *Rottler, Wight.*

*Stems* 6–12 in., branched, rooting, sparingly pubescent. *Leaves* 2 by 1 in., acuminate at both ends, crisp, lineolate; petiole  $\frac{3}{4}$  in. *Heads* many-fld., axillary and terminal; bracts  $\frac{1}{2}$  in., obovate; bracteoles  $\frac{1}{6}$  in., lanceolate, densely lineolate, white-hirsute upwards. *Sepals*  $\frac{1}{6}$  in., 5, subequal, lanceolate, below glabrous scarious, tips hispid with white hairs. *Corolla*  $\frac{2}{3}$  in., tube for  $\frac{1}{4}$  in. cylindric, for  $\frac{1}{4}$  in. ventricose or almost hemispheric; mouth subequal. *Anthers* subequal, of the longer filaments subexsert. *Ovary* glabrous, tip glandular-pubescent; ovules 6–8, on retinacula. *Capsule* not seen.—Much resembling *Cardanthera triflora*, but the corolla is smaller, not (or obscurely) bilabiate. T. Anderson placed this with his *Stenosiphonium zeylanicum*, which has 4 ovules and a differently shaped corolla, and is *Strobilanthes exsertus* described below.

4. ***H. confinis***, *T. Anders. in Journ. Linn. Soc.* ix. 463; thinly softly white-hairy, leaves petioled elliptic narrowed to both ends obsoletely crenate, bracteoles hardly half as long as the calyx. *Ruellia confinis*, *Nees in DC. Prodr.* xi. 148.

MERGUI and MALACCA; *Griffith, Maingay, Cuming.*—DISTRIB. Java, Borneo (not Philippines).

*Stems* 2 ft., sparsely hairy. *Leaves*  $3\frac{1}{2}$  by  $1\frac{1}{4}$  in., obtuse or obtusely acuminate, raphides plentiful but obscure; petiole  $\frac{1}{3}$  in. *Spikes* terminal, dense, often elongate (especially in fruit) 2–3 in., oblong, or subglobose when young; bracts  $\frac{1}{3}$ – $\frac{1}{2}$  in., ovate, subacute, imbricate, sub-4-seriate, hairy often viscidly; bracteoles  $\frac{1}{8}$ – $\frac{1}{6}$  in., linear or narrow. *Sepals*  $\frac{1}{4}$ – $\frac{1}{3}$  in., narrowly lanceolate sublinear, one slightly larger. *Corolla*  $\frac{1}{2}$  in., with few white hairs within; lower cylindric portion about as long as the suddenly ventricose. *Filaments* glabrous or nearly so; anthers 2-celled, long. *Ovary* and style glabrous. *Capsule* about  $\frac{1}{4}$  in., usually 8-seeded.—*Kurz (Journ. As. Soc.* 1871, pt. ii. 74) reduces this to *Ruellia Blumeana*, *Nees*, which differs much, by the spikes short not quadrifarious, the filaments bearded, &c.

Sect. 2. *Corolla* narrowly tubular-funnel-shaped, limb blue. Longer *filaments* densely bearded in their upper half by long obtuse white papillose hairs.

5. ***H. latebrosa***, *Nees in DC. Prodr.* xi. 723; diffuse, hairy, leaves petioled ovate crenate or serrate, bracteoles 0, capsule less than  $\frac{1}{3}$  in. 6-seeded. *Wight Ic.* t. 1504. *H. elegans*, *T. Anders. in Journ. Linn. Soc.* ix. 463, not of *Nees.* *H. Pavala*, *Kurz in Journ. As. Soc.* 1870, pt. ii. 78.



*Ruellia Pavala*, *Roxb. Fl. Ind.* iii. 47. *R. latebrosa*, *Roth Nov. Sp.* 307; *Nees in Wall. Pl. As. Rar.* iii. 83, *not of Roxb.* *R. erecta*, *Ham.; Wall. Cat.* 2395. *R. fasciculata*, *Wall. Cat.* 2394, *part of A sheet only.* *Ruellia elegans*, *Bot. Mag.* t. 3389; *Dalz. & Gibs. Bomb. Fl.* 186.

Throughout the DECCAN PENINSULA, alt. 0–4000 ft., from S. Behar (*J. D. H.*) to Coorg (*Wight*); common.

*Stems* 1–2 ft., branching, weak, hairs soft patent white. *Leaves*  $2\frac{1}{2}$  by  $1-1\frac{1}{2}$  in., acuminate at both ends, sparsely hairy, obscurely (or not) lineolate; petiole  $1-1\frac{1}{2}$  in.; leaves on the secondary flowering branches much smaller. *Bracts* ovate or elliptic, scarcely longer than the calyx, or of the outermost flowers petioled, and greatly exceeding the calyx. *Sepals*  $\frac{1}{5}-\frac{1}{4}$  in., subequal, linear-lanceolate, whitened, hairy not obviously lineolate. *Corolla*  $\frac{2}{3}-\frac{3}{4}$  in., nearly straight; tube pale or yellowish, gradually narrowed upwards, limb blue. Shorter *filaments* glabrous; anthers narrowly oblong, cells triangular acute (not awned). *Capsule*  $\frac{1}{4}$  in., rarely  $\frac{1}{3}$  in., minutely patently hairy, 6-seeded.—This hardly differs from *H. elegans*, *Nees*, but by the smaller capsule with 6 (not 8) seeds. T. Anderson considered them one.

*VAR. rupestris*; more pubescent, often viscid aromatic, heads denser. *Ruellia diffusa*, *Wall. Cat.* 2383, *letters C, D.* *R. satpooensis*, *Wawra in Oestr. Bot. Zeit.* 1881, 281, and in *It. Pr. Cob. Bot.* i. 90, t. 8 B.—Deccan Peninsula, Chota Nagpore, Rajpootana. N.W. Himalaya, alt. 2–5000 ft.; Kumaon, *Strachey & Winterbottom*; Sewaliks, *Stewart*.—Even commoner than the type, more rigid, growing in drier places. It was distributed as *Ruellia rupestris* to Wallich and to Roth (see *Roth Nov. Sp.* 307). The authentic sheet named by Heyne in *Herb. Rottler* consists partly of this, partly of *Lepidagathis fasciculata*.

*VAR. Beddomei*; much less hairy, leaves small ovate serrate or crenate glabrate.—Bellary; *Beddome*.

6. ***H. ebracteolata***, *Clarke*; hispid with scattered white hairs, leaves small petioled ovate serrate, bracteoles 0, capsule  $\frac{1}{3}$  in. 6-seeded. *H. rupestris*, *T. Anders. in Journ. Linn. Soc.* ix. 462, *partly.* *Ruellia ebracteolata*, *Dalz. in Hook. Kew Journ.* ii. 342. *R. latebrosa*, *Dalz. & Gibs. Bomb. Fl.* 186.

BOMBAY GHATS; *Dalzell, Stocks*.

*Leaves*  $1\frac{1}{4}$  by 1 in. (mostly smaller), obtuse or very shortly acuminate, base obtuse or almost rounded, cuneately decurrent on the petiole, coarsely toothed, hairs stiff (almost bristly) especially on the nerves beneath; raphides plentiful but obscure. Otherwise altogether as *H. latebrosa*, *Nees*, of which *Dalzell* finally considered it a form.—*H. rupestris*, *T. Anders.*, is made up of *Ruellia rupestris* and of *R. ebracteolata*, *Dalz.*; but *Dalzell's R. ebracteolata* is much remoter from *R. rupestris* than is the latter from *Hemigraphis latebrosa*, *Nees*.

7. ***H. flaccida***, *Clarke*; stems long softly patently hairy, leaves petioled ovate or elliptic subentire or obsoletely crenate, heads small few-fl., bracteoles 0. *Ruellia flaccida*, *Kurz in Journ. As. Soc.* 1873, pt. ii. 91.

PEGU; *Kurz*.

Longer filaments bearded upwards, shorter naked. *Bracts* not fimbriate nor flowers solitary (as *Kurz* describes). *Capsule* not seen.—As *Kurz* admitted *H. latebrosa* to be of the genus *Hemigraphis*, he erred in placing this species in *Ruellia*; for it is closely allied to *H. latebrosa*. The white hairs on the stems are  $\frac{1}{8}$  in. long, very copious, nearly similar to those of *H. latebrosa*. If this is well separable from *H. latebrosa*, it must be by the very entire leaves; in *H. latebrosa* the larger leaves (on the principal stem) are always prominently toothed.

8. ***H. elegans***, *Nees in DC. Prodr.* xi. 722, *of T. Anders. partly*; diffuse, patently softly white-hairy, leaves petioled ovate or elliptic crenate-serrate, bracteoles 0, capsule  $\frac{1}{3}$  in. 8–10-seeded. *Ruellia diffusa*, *Wall.*



*Cat.* 2383, letters A, B; *Nees in Wall. Pl. As. Rar.* iii. 83. *Strobilanthes burmanica*, *Kurz in Journ. As. Soc.* 1873, pt. ii. 92.

PEGU; *Wallich, Kurz*.—DISTRIB. Ava.

Similar to, but stouter than, *H. latebrosa*; leaves less sharply toothed. Inner bracts of the heads  $\frac{1}{2}$ – $\frac{3}{4}$  in., narrowly elliptic or oblong, overtopping the calyx. Corolla  $\frac{3}{4}$  in. and upwards; larger and broader than that of *H. latebrosa*. Stamens as in *H. latebrosa*, or (fide Nees) one anther-cell sometimes rudimentary.—The long inner bracts give this plant a different aspect from the Deccan *H. latebrosa*. Bracteoles 0; Nees says lanceolate longer than the calyx, from which it is probable that he means by bracteole that which he has called bract in the diagnosis of the same species. Kurz's *Strobilanthes burmanica* is more hairy than Wallich's Pegu examples; and it may be doubtful if several of the species here admitted are other than local varieties of *H. latebrosa*.

VAR. *crenata*; viscid-pubescent, less softly white hairy, leaves crenate. *Ruellia crenata*, *Benth.*; *Hohenack. in Flora* 1849, 558. Malabar; Canara, *Hohenacker*, n. 737; Concan, *Stocks*; Belgaum, *Ritchie*; Bombay, *Law*; Bellary, *Beddome*.

9. **H. Griffithiana**, *T. Anders. in Journ. Linn. Soc.* ix. 463; leaves lanceolate remotely obscurely toothed glabrate, heads terminal shortly cylindric hairy, bracteoles much shorter than the calyx. *Ruellia Griffithiana*, *Nees in DC. Prodr.* xi. 149.

MERGUI; *Griffith* (Kew Distrib. n. 6091); Tenasserim, *Helfer* (Kew Distrib. n. 6187).

Rootstock perennial; stems several, 1 foot, erect, scarcely branched, slender, pubescent upwards. Leaves 2 by  $\frac{1}{3}$  in., sessile, attenuate to both ends, pubescent when young. Spikes  $\frac{1}{3}$ –1 in., viscidly hairy; bracts  $\frac{1}{4}$ – $\frac{1}{2}$  in., elliptic, subobtusely; bracteoles  $\frac{1}{8}$ – $\frac{1}{6}$  in., narrow. Sepals  $\frac{1}{4}$  in. and upwards, linear-lanceolate, not very unequal. Corolla  $\frac{1}{2}$  in. and upwards, more ventricose than in others of this section, bearded in the palate within. Longer filaments densely bearded upwards with long white hairs, shorter glabrous. Capsule rather more than  $\frac{1}{4}$  in., usually 8-seeded. Seeds  $\frac{1}{16}$  in., much compressed, discoid, densely elastically white-hairy when wetted.

10. **H. quadrifaria**, *T. Anders. in Journ. Linn. Soc.* ix. 463; hirsute, leaves ovate or elliptic acute, bracts large, corolla  $1\frac{1}{4}$  in. *Ruellia quadrifaria*, *Wall. Cat.* 7152; *Nees in Wall. Pl. As. Rar.* iii. 83, and in *DC. Prodr.* xi. 147.

MOULMEIN; *Parish*, n. 403. TENASSERIM; *Beddome*, nn. 96, 97.—DISTRIB. Ava.

Hirsute with white or yellowish hairs from tubercular bases. Branch stout, shrubby. Leaves  $4\frac{1}{2}$  by  $2\frac{1}{2}$  in., upper narrower, base obtusely rhomboid, crenate-serrate; petiole  $\frac{1}{3}$  in. Heads dense, terminal and peduncled on short axillary branches, hirsute; bracts 1 by  $\frac{1}{3}$ – $\frac{1}{2}$  in., inner gradually smaller; bracteoles linear-lanceolate rather shorter than the calyx. Sepals  $\frac{1}{2}$  in., narrowly lanceolate, bases subconnate. Corolla sparingly pubescent, more ventricose than in the other species of this section, "deep blue" (*Parish*). Filaments of the longer stamens densely shaggy with long white hairs to the apex; anthers all subequal, muticous. Style simple, hairy; ovules 4–6 in each cell. Capsule  $\frac{1}{2}$  in., narrowly oblong, slightly hairy upwards, 8–12-seeded nearly from the base.

11. **H. glaucescens**, *Clarke*; leaves oblong narrowed to each end scabrid pubescent on the nerves beneath, spikes dense strobilate, bracts ovate acute hirsute, bracteoles very small lanceolate. *Strobilanthes glaucescens*, *Nees in Wall. Cat.* 7155, and in *Wall. Pl. As. Rar.* iii. 85, and in *DC. Prodr.* xi. 178; *T. Anders. in Journ. Linn. Soc.* ix. 467.

PEGU and TENASSERIM; *Griffith*, &c.

A shrub; branches scabrous. Leaves 6 by 2 in., crenulate, lineolate, sparingly



setulose above, more pubescent beneath; nerves 9–10 pair; petiole  $\frac{3}{4}$  in. *Spikes* 1–3 in., ovoid or cylindric, very shortly peduncled, solitary; bracts  $\frac{3}{4}$  in., green, persistent; bracteoles  $\frac{1}{8}$ – $\frac{1}{6}$  in. *Sepals*  $\frac{1}{3}$  in., linear-lanceolate, hairy. *Corolla* 1 in. (purple?) straight, subsymmetric, upper half narrowly ventricose. Longer *filaments* densely bearded with long white hairs turned to one side. *Ovary* glandular-hirsute upwards; style sparsely hairy. *Capsule*  $\frac{1}{3}$  in., pubescent, 6-seeded. *Seeds*  $\frac{1}{12}$  in., compressed, orbicular, when wet the fine white hairs spring out abundantly on all sides; areoles 0.—Habit and fruit-spikes so exactly those of a typical *Strobilanthes* that neither Nees nor T. Anderson appear to have tried the ovules; they are always 6, and the capsule has 6 seeds on 6 retinacula.

Sect. 3. *Corolla* large, tubular, yellow. Longer *filaments* bearded in their upper half by long obtuse white papillose hairs.

12. **H. flava**, Kurz in *Journ. As. Soc.* 1871, pt. ii. 74; leaves large obovate narrowed at both ends scabrous finally glabrate, bracts elliptic long acuminate, bracteoles lanceolate acuminate, corolla  $1\frac{1}{2}$ – $1\frac{3}{4}$  in. *Ruellia flava*, Roxb. *Fl. Ind.* iii. 43, and  *Ic. Ined.*; Nees in *DC. Prodr.* xi. 153. *Strobilanthes* scaber, T. Anders. in *Thwaites Enum.* 227, excl. all syn.; Benth. in *Gen. Pl.* ii. 1087 (as to the Pegu plant). *S. flavus*, Kurz *For. Fl.* ii. 243.

PEGU; Roxburgh, Kurz. MOULMEIN; Griffith (Herb. Propr. n. 278), Lobb. TENASSERIM; Beddome. CEYLON?; Walker (? cultivated).

A shrub; branches glabrous. *Leaves* 8 by 3 in., minutely crenulate, tubercular, scabrous, becoming nearly glabrous; petiole  $\frac{1}{2}$  in. *Heads* terminal on the arms of a panicle, dense, sparingly ciliate or glabrous; bracts  $\frac{3}{4}$  in.; bracteoles  $\frac{1}{2}$  in. *Sepals* nearly  $\frac{1}{2}$  in., linear. *Corolla* densely hairy within, ventricose portion about as long as the cylindric. *Anthers* connivent in pairs. *Ovary* with (at least) 6 ovules. *Capsule* (fide Kurz) 8-seeded.—The inflorescence is *Strobilanthes*-like, and it might be more naturally placed in *Strobilanthes*; but it is very distinct specifically from *S. scaber*, Nees, by the 6–8 ovules, very much longer flower and bearded filaments.—The 3 examples ticketed as from Ceylon have 6 ovules, and seem identical with the Pegu plant. Nees' *S. scaber* was a purple-fl. species founded on Wight n. 1945, on which type-sheet T. Anderson has written *S. heteromallus*, T. Anders., nov. sp.

## XVI. STENOSIPHONIUM, Nees.

Shrubs. *Leaves* ovate or elliptic, acuminate, lower tapering into the petiole, upper sessile, subcordate, crenate, upper surface densely covered by raphides. *Flowers* sessile, solitary or 2–3-nate in opposite axils; clusters running into close or interrupted spikes, or paniced; bract ovate or lanceolate; bracteoles 2, narrow, about as long as the calyx. *Calyx* subequally 5-fid, segments linear or lanceolate, imperfectly connate often for half their length. *Corolla* tubular-ventricose, suddenly widened about the middle; limb oblique, lobes 5, subequal, twisted to the left in bud. *Stamens* 2 perfect, or 4 perfect the 2 posterior much the smaller, anterior usually exerted; anthers oblong, 2-celled, muticous. *Ovary* and *style* glabrous, or at the apex of the ovary glandular. *Disc* small, annular. *Stigma* simple; ovules 3–4 in each cell. *Capsule* oblong-linear, seed-bearing nearly from the base. *Seeds* 6–8, on stout hooked retinacula, compressed, discoid, apparently glabrous; when moistened the abundant white hairs of extreme tenuity straighten out.—Species 5, all of the Deccan and Ceylon.

1. **S. diandrum**, Wight  *Ic.* t. 1502 (not of Nees); leaves rhomboid-elliptic or ovate, spikes interrupted viscous-pubescent, bracts ovate shorter than the calyx, flowering calyx divided more than half-way down teeth



linear viscous-pubescent, stamens 2. *S. confertum*, *T. Anders. in Journ. Linn. Soc.* ix. 464, *partim*.

*S. MADRAS*; Courtallum, *Wight*.

*Branches* glabrous. *Leaves* 3 by  $1\frac{1}{2}$  in., young obscurely scabrous beneath; petiole  $\frac{1}{3}$  in. *Spikes* 2–3 in., in terminal panicles, densely clothed with minute patent gland-headed hairs; lower whorls mostly 4–6-fld., distant even at flower-time; bract  $\frac{1}{4}$  in., ovate with a short obtuse apex; bracteoles rather longer than the bract, similar to the calyx-segments. *Calyx*  $\frac{1}{3}$  in.; segments linear-ligulate (not subulate), united at flower-time about  $\frac{1}{3}$  their length, in fruit free. *Corolla* exceeding  $\frac{3}{4}$  in. *Anterior filaments* minutely hairy at the base, posterior reduced to 2 microscopic teeth.

2. ***S. confertum***, *Nees in DC. Prodr.* xi. 105; leaves rhomboid-elliptic or ovate, spikes scarcely interrupted viscous-hairy, bracts obovate shorter than the calyx, flowering calyx divided nearly half-way down segments linear viscidly hairy, stamens 4. *T. Anders. in Journ. Linn. Soc.* ix. 464, *partim*. *S. Russellianum*, *Wight Ic.* t. 873, not t. 1503, as see *Wight's note under the latter*.

*S. DECCAN*; Pulney Mts. and near Courtallum, *Wight*.

Very near *S. diandrum*, *Wight*, and united therewith by *T. Anderson*; probably the posterior stamens may be present or absent in the same species. The present plant differs from *S. diandrum* in the leafy habit and shortened very hairy spikes, which have numerous white simple hairs in addition to the gland-tipped hairs. The stamens differ from those of all the other species, being all exserted; but the anthers of the posterior pair are hardly  $\frac{1}{3}$  as long as those of the anterior (this is not correctly shown by *Wight*).

3. ***S. setosum***, *T. Anders. in Journ. Linn. Soc.* ix. 464; leaves rhomboid-elliptic or ovate, flowering spikes dense somewhat interrupted below very hairy, bracts linear as long as the calyx, stamens 2.—*Strobilanthes* n. 67, *Herb. Ind. Or. H. f. & T.*

*MYSORE* or *CARNATIC*; *G. Thomson*.

*Leaves* altogether as of *S. diandrum*. *Spikes* 2–5 in., with white simple and gland-tipped hairs; bracts  $\frac{1}{3}$  in. and upwards, linear only slightly widened towards the base. *Calyx-segments* united for about  $\frac{1}{3}$  their length at flower-time, subulate, very hairy. *Flowers, stamens and capsules* exactly as of *S. diandrum*, from which this species hardly differs except by the bracts.

4. ***S. Russellianum***, *Nees in Wall. Pl. As. Rar.* iii. 84, and in *DC. Prodr.* xi. 105; leaves rhomboid-elliptic or ovate glabrous beneath, spikes linear much interrupted, bracts ovate as long as the calyx, corolla  $\frac{3}{4}$ –1 in., stamens 4. *Wight Ic.* t. 1503 (not t. 873); *T. Anders. in Journ. Linn. Soc.* ix. 464, *partly*. *Ruellia Russelliana*, *Wall. Cat.* 2400. *R. arcuata*, *Wall. Cat.* 2334 a & b.

*S. DECCAN PENINSULA*; plentiful in and around the Nilgherries, *Wight*, &c. *CEYLON*; *Walker, Thwaites*.

*Stems and leaves* as of *S. diandrum*. *Spikes* 3–6 in., elongate, all the whorls generally distinct even at flower-time, glabrous except a few minute bristles at the sepal-tips or (in *Wight's* n. 2189) sparingly glandular-pubescent; bracts (from the middle of the spike)  $\frac{1}{3}$  in., rhomboid, shortly obtusely mucronate, but the lower bracts often pass into leaves being  $\frac{3}{4}$  in. broad cordate-ovate, and the upper are often narrowly obovate. *Calyx*  $\frac{1}{3}$  in., segments united to the middle, teeth narrowly lanceolate acuminate, glabrous with minute white bristles or glandular-pubescent. *Anterior filaments* very hairy at their base; posterior about half as long, included. *Pistil and capsule* as in *S. diandrum*.

*VAR. subsericea*, *T. Anders. in Journ. Linn. Soc.* ix. 464; younger leaves densely white-silky beneath mature silky or glabrous beneath. *S. subsericeum*, *Nees in Wall.*



*Pl. As. Rar.* iii. 84, and in *DC. Prodr.* xi. 105. *Ruellia cordifolia*, *Vahl Symb.* iii. 84. *R. sesamoides*, *Wall. Cat.* 2408, part of sheet A only. *R. subsericea*, *Wall. Cat.* 2416. *R. canescens*, *Heyne in Herb. Rottler.*—S. Deccan Peninsula, *Rottler*; Courtallum, *Wight*.

Often twiggly, with small leaves.

5. ***S. parviflorum***, *T. Anders. in Journ. Linn. Soc.* ix. 464; leaves rhomboid-elliptic or ovate glabrate, spikes linear subinterrupted at base, bracts lanceolate, calyx small, teeth linear glandular-pubescent, corolla  $\frac{1}{2}$ – $\frac{2}{3}$  in., stamens 2.—*Strobilanthes* sp. n. 68, *Herb. Ind. Or. H. f. & T.*

MYSORE or CARNATIC; *G. Thomson*.

Very near *S. Russellianum*, differing mainly by the smaller calyx and corolla and narrower bracts. *Bract*  $\frac{1}{4}$  in. *Calyx* scarcely  $\frac{1}{4}$  in., divided half-way down. *Stamens* 2 only in n. 68 *H. f. & T.*; when T. Anderson says 4, he must have examined *Wall. Cat.* 2334 a & b; which T. Anderson referred to *S. parviflorum*, but which is typically *S. Russellianum*, *Nees*.

## XVII. **ÆCHMANTHERA**, *Nees*.

Small, hairy shrubs. *Leaves* broad-elliptic acute, crenate, often viscid. Clusters of *flowers* sessile on the branches of a trichotomous or 1-sided panicle, distant or close; bracts linear, as long as the calyx; bracteoles similar smaller. *Calyx* sub-5-partite; segments linear, subequal. *Corolla* tubular-ventricose, nearly straight, widened suddenly near the middle, glabrous, 2 hairy lines on the palate within; segments 5, subequal, rounded, twisted to the left in bud, pale-violet or purplish. *Stamens* 4, didynamous, included, longer filaments hairy, shorter glabrous; anthers subsimilar, ovate or oblong, 2-celled, cells muticous; connective excurrent at the tip or not. *Ovary* densely hairy at the apex; style sparsely hairy thickened upwards, stigma large simple linear-lanceolate; ovules 4–6 in each cell. *Capsule* narrowly oblong, 6–8- (or ex Benth. 12-) seeded from the base, retinacula strong, hooked. *Seeds* discoid, densely hairy, or thicker glabrous.—Species 2, Indian.

1. ***Æ. tomentosa***, *Nees in Wall. Pl. As. Rar.* iii. 87; leaves elliptic acute hairy, bracts linear-ligulate as long as the calyx, anthers oblong connective not excurrent, seeds densely hairy. *Ruellia tomentosa*, *Wall. Cat.* 2333.

TEMPERATE HIMALAYA, alt. 3–5000 ft.; Kumaon and Nepal, *Wallich, Thomson*.

A small shrub, 1–3 ft., dusky grey or whiteish, villous, not with snowy or silvery wool. *Leaves*  $4\frac{1}{2}$  by 2 in., base rounded, slightly crenate, densely (not prominently) lineolate with raphides; petiole  $1\frac{1}{2}$  in. *Panicles* often 1 foot, one-sided; clusters 3–8-fld., distant or approximate; bracts  $\frac{1}{2}$  in. or more; bracteoles narrowly ligulate, as long as the calyx or more often about half as long. *Sepals*  $\frac{1}{3}$ – $\frac{1}{2}$  in., linear-ligulate, somewhat unequal, herbaceous, pubescent, usually viscous. *Corolla* 1 in. *Anthers* particularly obtuse in *Wall. Cat.* 2333, and the examples closely similar therewith, even in the buds just before expansion. *Capsule*  $\frac{1}{3}$  in., 8-seeded; hairs of the seeds starting out when wetted.

VAR. *Wallichii*; stem and leaves with snow-white wool or glabrate sparsely hairy, anthers ovate, tip of the connective excurrent recurved. *Æ. Wallichii*, *Nees in DC. Prodr.* xi. 170; *T. Anders. in Journ. Linn. Soc.* ix. 485. *Æ. gossypina*, *Nees in Wall. Pl. As. Rar.* iii. 87. *Ruellia gossypina*, *Wall. Cat.* 2332, and *Pl. As. Rar.* i. 38, t. 42.—Acanthacea, *Griff. Itin. Notes*, 119, n. 308.—Temperate Himalaya, alt. 3–5000 ft., from Kashmir to Bhotan. Chittagong; Seetakoond, alt. 1000 ft., *H. f. & T.*—Wallich's figure shows the connective non-excurrent, but it always is more or



less so in the white-woolly form. In the two examples on one sheet marked by Nees' hand *Wallichii* and *tomentosa*, the former has the connective conspicuously, the latter minutely, excurrent. The East Himalaya examples are flowerless, and may belong to *Æ. tomentosa*, type. The Chittagong example is densely snowy-woolly with 6 hairy seeds, and is therefore *Æ. tomentosa* var. *Wallichii*, or a new species.

2. **Æ. leiosperma**, *Clarke*; hairy, leaves ovate or elliptic acute, bracts linear-ligulate as long as the calyx, anthers oblong connective excurrent at the tip, seeds glabrous.

JAINTEA and E. KHASIA, alt. 3–4000 ft.; abundant, *Clarke*.

A small shrub, 2–3 ft. high, very hairy, often viscid, with both brown and white hairs. *Leaves* 3 by  $1\frac{1}{2}$  in., rounded at the base, crenulate; petiole  $\frac{1}{2}$  in. *Panicle* resembling that of *Æ. tomentosa*, often somewhat leafy; bracts  $\frac{1}{2}$  in., linear-ligulate; bracteoles  $\frac{1}{3}$  in., similar to the bracts. *Sepals*  $\frac{1}{3}$  in., subequal, linear-ligulate, very hairy. *Corolla*, *stamens* and *pistil* as of *Æ. tomentosa*, but the connective more excurrent than in any form of *Æ. tomentosa*. *Capsule*  $\frac{1}{3}$  in., 6-seeded. *Seeds* much thicker than in *Æchmanthera*, and without hairs.—I cannot match these seeds without going to quite another part of the Acanthaceæ Order. They are glabrous when *wetted*, not discoid. On the other hand, except the seeds, the plant is hardly distinguishable from *Æ. tomentosa*. There are abundant specimens with seeds *in situ*.

### XVIII. STROBILANTHES, *Blume*.

Large or small shrubs, or herbs. *Leaves* opposite, often unequal, in *S. anisophyllus* often apparently alternate, toothed or subentire, often bearing raphides. *Flowers* capitate, or in strobiliform or interrupted spikes, or paniced, sessile or sometimes pedicelled, purple yellow or white; bracts and bracteoles large or small or 0, persistent or caducous. *Calyx* deeply subequally 5-fid; or (in Sect. *Buteræa*) 2-lipped, with one lip very shortly 3-toothed; segments narrow, equal or unequal. *Corolla* tubular-ventricose, straight or curved; lobes 5, ovate or round, subequal, contorted in bud. *Stamens* 4, didynamous, or (in Sect. *Endopogon*) 2; anthers oblong, 2-celled, muticous. *Disc* small, or prominent as a stalk to the ovary. *Ovary* 4-ovulate; style linear, stigma of one long linear-lanceolate branch, the other suppressed. *Capsule* 4- or 2-seeded; placentæ (in a few species only) rise elastically from the base, carrying the seeds with them. *Seeds* much compressed, glabrous or hairy, hairs elastic when wetted; retinacula curved, strong.—Species 180, Asiatic and 1 in Africa.

This genus contains a great number of species differing widely in habit, inflorescence and size of the flowers. It is here limited to species with 2 ovules in each cell of the ovary. All with more than 2 in each cell have been carried to *Ruellia*, *Echinacanthus*, *Hemigraphis*, *Stenosiphonium* and *Æchmanthera*.

*Strobilanthes roseus*, Wall. Cat. 7154, is an Ava plant, not known from British India.

*Stobilanthes salicifolius*, T. Anders. in Journ. Linn. Soc. ix. 484, is a plant of altogether uncertain origin.

*Strobilanthes biceps*, T. Anders. in Journ. Linn. Soc. ix. 476 = *Goldfussia biceps*, Wall. Cat. 7161, Nees in DC. Prodr. xi. 172, is an Ava plant.

#### Key to the Sections of *Strobilanthes*.

Subgenus 1. BUTERÆA. Calyx bilabiate. Species 1–4, of Pegu and Tenasserim.

Subgenus 2. ENDOPOGON. Stamens 2.

Seeds glabrous. Species 5–12, of Ceylon with 1 in S. Deccan.

Seeds hairy. Species 13–18, of S. Deccan.

Species 19, 20, of Khasia.



Subgenus 3. **EUSTROBILANTHES**. Calyx subequally deeply 5-fid. Stamens 4.

Series A. *Bracteata*. Bracts persistent. Flowers spiked or opposite, not mostly alternate.

\* Flowers capitate or shortly spicate.

† Seeds glabrous. Species 21–32, of Ceylon and Deccan.

†† Seeds hairy.

¶ Species 33–46, of Ceylon and Deccan.

¶¶ Species 47–56, of N. India and Malay Peninsula.

\*\* Flowers strobilate.

† Seeds glabrous. Species 57–64, of Ceylon and Deccan.

†† Seeds hairy. Species 65–78.

\*\*\* Spikes elongate often much interrupted. Species 79–87.

Series B. *Nudata*. Bracts caducous. Flowers capitate or opposite, not mostly alternate.

\* Heads in fruit capitate. Species 88–100.

\*\* Heads in fruit elongate or flowers distant. Species 101–119.

Series C. *Alternifloræ*. Flowers mostly distant alternate, or paniced. Species 120–136, of N. India and Malaya.

Series D. *Paniculata*. Bracts persistent. Flowers paniced or interruptedly spicate. Capsule wide, very acute. Species 137–145, of Ceylon and S. Deccan.

Residuary. Species 147–154, not seen.

Subgenus 1. **Buteræa**. Calyx 2-lipped to the base; one lip 3-fid less than one-third the way down, the other 2-fid or 2-partite.—(Spikes strobili-form; bracts prominent, imbricate. Stamens 4. Seeds (where known) elastically hairy when wetted.—Species of Pegu and Tenasserim.)

1. **S. rufescens**, *T. Anders. in Journ. Linn. Soc.* ix. 472; leaves ovate acute crenate more or less rufous-hairy, spikes dense strobilate hirsute, bracts broadly ovate, calyx 2-partite both segments very shortly toothed. *Ruellia rufescens*, *Roth Nov. Sp.* 304. *R. comosa*, *Roxb. Fl. Ind.* iii. 43, and  *Ic. Ined. in Herb. Kew.* *R. ulmifolia*, *Wall. Cat.* 2360. *Buteræa ulmifolia*, *Nees in Wall. Pl. As. Rar.* iii. 84, and in *DC. Prodr.* xi. 196.

PEGU; *Brandis*.—DISTRIB. Moluccas (*Roxburgh*).

A shrub; branches perfectly glabrous, or intensely shaggy with red hairs  $\frac{1}{4}$ – $\frac{1}{3}$  in. long. Leaves  $1\frac{1}{2}$ –4 in., often unequal, base obtuse or rounded, hirsute on both surfaces in the type examples, nerves 6 pair; petiole  $\frac{1}{8}$ – $1\frac{1}{2}$  in. Spikes 1–2 in., short-peduncled; bracts  $\frac{1}{3}$  in., fulvous-hirsute; bracteoles scarcely  $\frac{1}{6}$  in., sublinear. Calyx  $\frac{1}{3}$  in., 2-partite to the base, rufous-ciliate towards the apex; segments very shortly toothed, one 2-toothed, the other 3-toothed with the middle tooth broader subemarginate. Corolla 1 in., pale-purple, cylindric base of the tube rather shorter than the moderately ventricose part. Capsule  $\frac{1}{4}$  in., densely pubescent, 4-seeded. Seeds less than  $\frac{1}{12}$  in., orbicular, fine elastically white-hairy, areoles 0.

VAR. *rubiginosa*; leaves larger thinner glabrate lineolate above, bracteoles  $\frac{1}{16}$  in., ovate.—Tenasserim; *Helfer* (*Kew Distrib.* n. 6118). Chittagong; *Clarke*.—Stems thinly shortly rufous-hirsute; leaves  $5\frac{1}{2}$  by  $2\frac{3}{4}$  in., base shortly acuminate, crenate, green, herbaceous; nerves beneath thinly rufous-hairy.—*Helfer*'s example is unlike those of *Ruellia ulmifolia*, but very like the figure of *R. comosa*, *Roxb.* *Clarke*'s examples have the stems sparsely or densely rufous-hirsute, the leaves glabrate lineolate above or rufous-hirsute; the corolla is  $1\frac{1}{4}$  in., pale-purple, nearly glabrous with glabrous filaments, altogether as in *Roxburgh*'s picture.

2. **S. acuminatus**, *T. Anders. in Journ. Linn. Soc.* ix. 473, partly; leaves lanceolate acuminate at both ends crenate nearly glabrous, spikes oblong short-peduncled glandular, bracts ovate shorter than the calyx, calyx sub-2-partite one lip shortly trifid the other bifid nearly to the base. *S. subflaccidus*, *Kurz in Journ. As. Soc.* 1873, pt. ii. 94, *ex descr.* *Adena-*



canthus acuminatus, *Nees in Wall. Cat.* 7153, and in *Wall. Pl. As. Rar.* iii. 84, and in *DC. Prodr.* xi. 197 (*excl. tab. cited*).

BURMA; "locus incertus," *Wallich*.

A herb; branches elongate, nearly glabrous. *Leaves* 5 by  $1\frac{1}{2}$  in., base long attenuate, often subserrate, lineolate above; nerves 6-7 pair, minutely fuscous pubescent beneath; petiole  $0-\frac{1}{3}$  in. *Peduncles*  $\frac{1}{4}$ -2 in.; spikes  $\frac{1}{2}$ -1 in.; bracts  $\frac{1}{4}$  in., ovate; bracteoles  $\frac{1}{4}$  in., elliptic, wider upwards than the bracts. *Calyx* scarcely  $\frac{1}{3}$  in., glandular-ciliate. *Corolla* (ex *Nees*)  $\frac{1}{2}$  in. at least, glabrous, tubular; limb equal with obtuse segments. *Ovary* 4-ovulate. *Capsule* not known.—Description mainly from *Nees*, the single sheet of *Wallich* being too imperfect to verify several points. *T. Anderson*, proceeding on the similarity in the leaves, has assumed that *Nees'* description is materially wrong, and that *Wall. Cat.* 7152 is really identical with *S. longipes*, n. 76 *infra*. If that be so, it remains as *S. subflaccidus*, *Kurz*.

3. ***S. Parishii***, *Clarke*; leaves elliptic acuminate thinly hirsute, spikes linear-oblong strobilate white-hairy, bracts oblong or slightly wider upwards, calyx 2-partite both segments very shortly toothed.

MOULMEIN; *Parish*. TENASSERIM; *Beddome*.

A branching herb; stems subterete rufous-pubescent or subhirsute. *Leaves*  $5\frac{1}{2}$  by  $2\frac{1}{4}$  in., base cuneate or obtuse, crenate, nerves 6 pair; petiole  $\frac{1}{2}$ -2 in. *Spikes* 2 by  $\frac{1}{2}$  in., short-peduncled; bracts  $\frac{1}{2}$  by  $\frac{1}{8}-\frac{1}{6}$  in., obtuse; bracteoles  $\frac{1}{6}$  in., linear. *Calyx*  $\frac{1}{3}$  in., nearly as of *S. rufescens*. *Corolla*  $1\frac{1}{4}$  in., nearly straight, glabrous, blue; cylindric base of the tube hardly half so long as the campanulate; lobes short, round. *Capsule*  $\frac{1}{4}-\frac{1}{3}$  in., pubescent, 4-seeded. *Seeds* scarcely  $\frac{1}{12}$  in., orbicular, elastically white-hairy; areoles hardly any.

4. ***S. foetidissima***, *Kurz in Journ. As. Soc.* 1873, pt. ii. 93; leaves ovate acuminate at both ends serrate-dentate hirsute on both surfaces, spikes short-peduncled lax short tawny-hirsute, bracts obovate-cuneate obtuse, calyx-segments deeply lobed.

MARTABAN; *Kurz*.

A herb; branches fulvous-hairy. *Leaves* 3-5 in., membranous, long-petioled. *Bracts*  $\frac{4}{5}$  in., glandular-hirsute; bracteoles similar, but shorter and broader. *Calyx* as long as the bracts, adpressedly glandular-puberulous. *Corolla*  $1\frac{1}{2}$  in., and *filaments* glabrous. *Style* hirsute. *Capsule*  $\frac{4}{5}$  in., glabrous. *Seeds*  $\frac{1}{2}$  in. diam., adpressedly villous.—Copied from *Kurz*, who says it is allied to *S. rufescens*, whence it is presumed the calyx is definitely 2-lipped; but in the large capsule and seeds it differs from the other species allied to *S. rufescens*.

Subgenus 2. **Endopogon**. *Calyx* deeply subequally 5-fid. *Stamens* 2 fertile.—(Spikes mostly continuous, sometimes shortened into heads, less commonly interrupted at the base, the lowest flowers then in opposite pairs; bracts persistent).

\* Seeds (even in water) glabrous, without areoles on the faces.—Lower half of the corolla-tube cylindric, suddenly widening into the ventricose part.—Species of Ceylon, with one (*S. foliosus*) in the S. Deccan Peninsula.

5. ***S. viscosus***, *T. Anders. in Thwaites Enum.* 226, *excl. syn. Wight*, and in *Journ. Linn. Soc.* ix. 465, *partly*; leaves elliptic acuminate at both ends crenulate sparsely pubescent or glabrate, spikes linear subinterrupted viscous-hairy, flowering calyx  $\frac{1}{3}$  in. divided less than half-way down. *Endopogon viscosus*, *Nees in DC. Prodr.* xi. 104, *excl. Var. humilis, not of Wight*.

CEYLON, up to 7000 ft. alt., frequent; *Gardner, Walker, Thwaites* (n. 2898, n. 2002, *partly*), &c.



A shrub, 2–5 ft. *Leaves* 4 by  $1\frac{2}{3}$  in.; nerves 7–8 pair, not conspicuously parallel; petiole  $\frac{3}{4}$  in. *Spikes* 3–8 in., axillary, simple or compound, and running into terminal panicles; flowers opposite, lowest pair usually distant; bracts  $\frac{1}{2}$  in., elliptic or oblong, attenuated upwards; bracteoles  $\frac{1}{4}$ – $\frac{1}{3}$  in., narrow. *Calyx* viscidly hairy, teeth lanceolate; calyx in fruit enlarged often  $\frac{2}{3}$  in. or more, split to the base into lanceolate segments. *Corolla*  $1\frac{1}{2}$  in., densely pubescent without; linear-base of the tube  $\frac{1}{3}$  in., very narrow, ventricose portion  $\frac{1}{2}$  by  $\frac{1}{3}$  in., oblique, lobes ovate. *Filaments* glabrous except near the base; anthers large, pendulous, subexserted. *Capsule*  $\frac{1}{2}$  in., 4-seeded. *Seeds* more than  $\frac{1}{8}$  in., ovoid, thinning towards the apex, smooth, hairless.

VAR. *microphyllus*, Nees in DC. Prodr. xi. 104; leaves  $\frac{1}{2}$ – $1\frac{1}{4}$  in., spikes very weak few-fl. —Ceylon. —The type specimen of this has no fruit; but Walker, n. 122, has similar small leaves and fruit exactly as of *S. viscosus* type.

VAR. *digitalis*; bracts abbreviated, spikes elongate slender, minutely deciduously cinereous-woolly not hairy nor viscous. *Endopogon digitalis*, Nees in DC. Prodr. xi. 104 (sp.). —Ceylon; Walker. —This is possibly nearer *S. exareolatus*, but the example is in young flower.

VAR. *arguta*; leaves more rigid more acutely (though minutely) toothed, spikes dense, bracts  $\frac{1}{2}$  in. oblong imbricate, calyx minutely cinereous-woolly. *Endopogon argutus*, Nees in DC. Prodr. xi. 104. —Ceylon; Gardner. —The examples referred here by Nees (probably on the characters of the leaves) having fulvous viscid hairy spikes seem nearer *S. viscosus*, T. Anders. type.

6. ***S. stenodon***, Clarke; glabrous, leaves ovate acuminate crenate, spikes linear scarcely interrupted, bracts short obovate, calyx divided half-way down, corolla-lobes narrowly oblong.

CEYLON; Matelle East, Beckett, Thwaites, C. P. n. 3874.

*Leaves*  $4\frac{1}{2}$  by 2 in., shortly narrowed into the petiole; nerves 8 pair; petiole  $1\frac{1}{2}$  in.; leaves white underneath in Beddome's Ceylon specimen. *Spikes* 2–5 in., axillary, simple or compound, running into terminal panicles; bracts  $\frac{1}{4}$  in.; bracteoles  $\frac{1}{3}$  in., narrowly oblong. *Calyx* glabrous, teeth lanceolate. *Corolla* glabrous in bud, white-hairy within; cylindric base  $\frac{1}{3}$  in., very narrow; ventricose tube  $\frac{1}{3}$  in. long and broad; lobes  $\frac{1}{3}$ – $\frac{1}{2}$  in. *Anthers* exserted, pendulous. *Ovules* 2 in each cell. *Capsule* not seen. —A remarkable plant with the habit, inflorescence and bracts of *Stenosiphonium Russellianum*; the narrow lobes of the corolla are unlike any neighbouring species or genus.

7. ***S. exareolatus***, Clarke; leaves elliptic acuminate at both ends slightly undulate crenate glabrous, spikes linear lax hairy, calyx narrow overtopping the bracts divided less than half-way down. *S. consanguineus*, T. Anders. in Thwaites Enum. 226, and in Journ Linn. Soc. ix. 465, partly. *Stenosiphonium diandrum*, Nees in DC. Prodr. xi. 105, not of Wight. *Endopogon consanguineus*, Nees l. c. as to the Ceylon material.

CEYLON, alt. 3000 ft.; Walker.

A shrub. *Leaves*  $3\frac{1}{2}$  by  $1\frac{1}{2}$  in.; nerves 6 pair; petiole  $\frac{3}{4}$  in. *Spikes* 2–4 in., running into terminal panicles; bracts  $\frac{1}{4}$ – $\frac{1}{3}$  in., ovate or oblong; bracteoles  $\frac{1}{3}$  in., narrow. *Calyx* (in flower)  $\frac{1}{4}$ – $\frac{1}{3}$  in., teeth sublinear; in fruit enlarged. *Corolla*  $\frac{3}{4}$  in., resembling that of *S. viscosus* but smaller. *Capsule*  $\frac{1}{3}$  in., 4-seeded. *Seeds* scarcely  $\frac{1}{10}$  in., ellipsoid, smooth, hairless, without lateral areoles. —Near *S. viscosus*, differing by the short bracts, narrow cylindric calyx, smaller flowers and much smaller seeds. As to the synonyms, the type specimens of Nees and T. Anderson, written on by their own hands, are preserved at Kew.

VAR. *densa*; spikes denser, bracts elliptic imbricate often as long as the calyx. —Ceylon, alt. 2–6000 ft.; Thwaites, n. 2002 chiefly, &c.

8. ***S. rhytisperma***, Clarke; leaves elliptic acuminate at both ends denticulate thinly white-cottony beneath, spikes linear uninterrupted glabrous, bracts lanceolate about equalling the calyx. *S. hypoleucus*, T. Anders. in Thwaites Enum. 226, not *Endopogon hypoleucus*, Nees.



CEYLON; Central Province, *Thwaites*, C. P. 2897, collected by Gardner.

*Stem* glabrous. *Leaves* 5 by  $1\frac{3}{4}$  in., mature glabrous above; nerves 8 pair; petiole  $\frac{2}{3}$  in. *Spikes* 3–4 in., clustered in the axils (end of the branch not seen); bracts  $\frac{1}{2}$  in. *Calyx*  $\frac{1}{2}$  in., divided half-way down, hardly enlarged in fruit; teeth narrowly lanceolate, glabrous. *Corolla* glabrous without in bud. *Capsule*  $\frac{1}{3}$  in., 4-seeded. *Seeds*  $\frac{1}{10}$  in., obovate-elliptic, smooth, hairless, longitudinally wrinkled, without lateral areoles.

9. **S. nigrescens**, *T. Anders. in Thwaites Enum.* 226. and in *Journ. Linn. Soc.* ix. 465; leaves narrowly elliptic acuminate at both ends serrulate glabrous, spikes linear uninterrupted hirsute, bracts lanceolate mostly overtopping the calyx. *Bedd. Ic. Pl. Ind. Or.* t. 217.

CEYLON, alt. 3000 ft.; *Thwaites*, C. P. n. 3353.

A shrub, 4–5 ft., blackish-green when dry. *Leaves* 5 by  $1\frac{3}{4}$  in., lineolate above, reticulate beneath; nerves 7 pair; petiole  $1\frac{1}{4}$  in. *Spikes* 2–5 in., axillary, simple or compound, and running into terminal panicles; bracts  $\frac{1}{2}$  in.; bracteoles  $\frac{1}{4}$ – $\frac{1}{3}$  in., narrow. *Calyx*  $\frac{1}{2}$  in. and upwards hairy, divided about half-way down, enlarged in fruit. *Corolla* pale-purple, very nearly as of *S. viscosus*. *Capsule*  $\frac{2}{3}$  in., very broad and stout, 2-seeded (in *Thwaites*, 3353). *Seeds*  $\frac{1}{4}$  in. diam. (unripe), hairless and without lateral areoles.

10. **S. rhamnifolius**, *T. Anders. in Thwaites Enum.* 226, and in *Journ. Linn. Soc.* ix. 466; leaves ovate shortly acuminate crenate-serrulate glabrous, spikes linear-oblong very hairy densely paniced, bracts widely-elliptic imbricated. *Buteræa rhamnifolia*, *Nees in DC. Prodr.* xi. 725. *Endopogon rhamnifolius*, *Wight Ic.* t. 1521.

CEYLON, *Gardner*; alt. 3000 ft., *Thwaites*, C. P. n. 2007.

A shrub, 1–2 ft., hairy upwards. *Leaves*  $2\frac{1}{2}$  by  $1\frac{1}{2}$  in., base obtusely rhomboid; nerves 6 pair; petiole  $1\frac{1}{4}$  in. *Spikes* 1–4 in.; bracts  $\frac{2}{3}$  in., not acuminate; bracteoles  $\frac{1}{4}$ – $\frac{1}{3}$  in., linear-oblong. *Calyx*  $\frac{1}{2}$  in., very hairy, divided hardly half-way down (not so deeply as figured by *Wight*); teeth narrowly lanceolate. *Corolla*  $1$ – $1\frac{1}{4}$  in., purple, pubescent, cylindric portion more than  $\frac{1}{4}$  in., very narrow, ventricose portion  $\frac{1}{3}$ – $\frac{1}{2}$  in.; teeth ovate. *Stamens* 2; filaments sparsely hairy more than half their length. *Ovules* 2 in each cell.—The habit, bracts and shape of the corolla are much as in *S. exareolata* var. *densa*; but the capsule and seeds being unknown, the exact position is doubtful.

11. **S. deflexus**, *T. Anders. in Thwaites Enum.* 227, and in *Journ. Linn. Soc.* ix. 470; glabrous, leaves lanceolate acuminate at both ends denticulate, heads peduncled few-fl. closely capitate. *Bedd. Ic. Pl. Ind. Or.* t. 218.

CEYLON, alt. 3–4000 ft.; *Gardner*, *Thwaites*, C. P. 1998.

A shrub, 4–5 ft., green. *Leaves*  $4\frac{1}{2}$  by  $1\frac{1}{4}$  in.; nerves 6 pair; petiole 1 in. *Peduncles* axillary,  $1$ – $1\frac{1}{2}$  in., thickened upwards, deflexed; outer bracts  $\frac{3}{4}$  in., elliptic, often nearly enclosing the whole head; proper bract  $\frac{2}{3}$  in., lanceolate; bracteoles rather shorter, linear. *Calyx*  $\frac{2}{3}$  in., divided half-way down, glabrous or the linear-lanceolate teeth puberulous. *Corolla*  $\frac{3}{4}$ –1 in., pale purple, nearly glabrous, hairy in the palate within; cylindric base of the tube as long as (and suddenly widened into) the ventricose portion, not so funnel-shaped as in *Beddome's* figure. *Stamens* 2, glabrous. *Pistil* glabrous. *Capsule* not seen; and, the seeds being unknown, the affinity is doubtful.

12. **S. foliosus**, *T. Anders. in Journ. Linn. Soc.* ix. 467; leaves ovate serrulate glabrous, heads sessile ovoid densely capitate. *Goldfussia Leschenaultiana*, *Nees in DC. Prodr.* xi. 172. *Endopogon foliosus* & *capitatus*, *Wight Ic.* tt. 1501, 1499.

NILGHERY MTS., alt. 6–7000 ft., frequent; *Gardner*, *Wight*, &c.



*Stems* 1–2 ft., much branched, rigid. *Leaves* 2 by  $1\frac{1}{4}$  in., shortly acuminate at both ends, conspicuously lineolate above; nerves 5–6 pair; petiole  $\frac{1}{3}$  in. *Heads* numerous, terminal,  $\frac{1}{3}$  in. diam., each closely embraced by the two uppermost leaves (exclusive of the proper bracts); bracts  $\frac{3}{4}$  in., linear-oblong, at first nearly glabrous or hairy; bracteoles  $\frac{2}{3}$  in., linear, at first nearly glabrous or hairy. *Calyx*  $\frac{3}{4}$  in., divided hardly half-way down, obscurely or prominently hairy at flower-time, hirsute in fruit, segments narrowly lanceolate. *Corolla*  $1\frac{1}{4}$  in., blue or whiteish, glabrous without, hairy along 2 lines within; linear base of the tube about as long as the suddenly-widened ventricose part. *Filaments* hairy nearly to the summit; rudiments often 3, whereof 2 often carry minute rudimentary anthers. *Ovary* slightly hairy upwards. *Capsule*  $\frac{2}{3}$  in., 4-seeded. *Seeds*  $\frac{1}{3}$  in. long, very thin, glabrous; areoles 0.—There is no difference between the typical *foliosus* and the Var. *capitatus*; the heads on one stem which appear (superficially) glabrous in flower are very hairy in fruit, owing to the development of the hairs on the bract, bracteoles and calyx.

\*\* *Seeds* (in water) densely hairy except on two lateral circular areoles near the base on each face.—(Linear or subcylindric base of the corolla short, more gradually narrowing into the ventricose portion than in the preceding section.—Species of the S. Deccan Peninsula.)

13. **S. Kunthianus**, *T. Anders. in Journ. Linn. Soc.* ix. 465; leaves elliptic narrowed into the petiole crenate-serrate rigid strongly nerved beneath, spikes dense, bract ovate, calyx deeply divided, corolla 1 in. blue. *Ruellia Kunthiana*, *Wall. Cat.* 2367. *Phlebophyllum Kunthianum*, *Nees in Wall. Pl. As. Rar.* iii. 83, and in *DC. Prodr.* xi. 102; *Wight Ic.* t. 448. *P. angustifolium*, *Benth. in Pl. Hohenack.* n. 1178.

MTS. of S. DECCAN PENINSULA, alt. 5000–7500 ft.; plentiful in the Nilgherries, *Wight*, &c.

*Stems* 12–20 in., numerous, erect, rigid, quadrangular upwards. *Leaves* 2 by 1 in., obtuse or subacuminate, bristly or scabrid above; primary nerves beneath close, parallel, prominent, secondary reticulated more or less concealed by close hard white tomentum; petiole  $\frac{1}{4}$  in., very broad. *Spikes* 1–3 in., hairy; bract  $\frac{1}{2}$  in.; bracteoles  $\frac{1}{3}$  in., linear-ligulate. *Calyx*  $\frac{1}{3}$ – $\frac{1}{2}$  in., floccose-villous; segments linear-lanceolate, base shortly connate. *Corolla* ventricose from near the base, palate hairy within, blue or whiteish. *Filaments* pilose. *Ovary* glabrous; style hairy. *Capsule*  $\frac{1}{3}$ – $\frac{1}{2}$  in., oblong, rigid. *Seeds* 4, densely hairy (hairs spreading when wet) except on the circular basal areola on each of its faces.

14. **S. gossypinus**, *T. Anders. in Journ. Linn. Soc.* ix. 466; leaves ovate acute entire woolly beneath, spikes linear-oblong woolly, corolla  $1\frac{1}{4}$  in. woolly without. *Bedd. Ic. Pl. Ind. Or.* t. 198.

MTS. of S. DECCAN PENINSULA, alt. 4000–5500 ft.; Mysore, *Lobb*; *Sispara* plentiful, &c., *Beddome*.

Shrubby, covered (except the leaves above) with dense yellowish wool, flowering at 6–7 years old, then dying. *Leaves* 4 by 2 in., base broadly rhomboid, subcoriaceous, wool of upper surface deciduous; nerves 13 pair, approximate, subparallel; petiole  $\frac{3}{4}$  in. *Spikes* 1–3 in., compound and (by the reduction of the upper leaves) running into terminal panicles; bracts  $\frac{1}{3}$ – $\frac{1}{2}$  in., elliptic, obtuse; bracteoles  $\frac{1}{3}$  in., linear-oblong. *Calyx* nearly  $\frac{1}{2}$  in., divided about half-way down; segments narrowly lanceolate, subobtuse. *Corolla* nearly straight; ventricose portion of the tube much longer than the cylindric base. *Filaments* hairy. *Ovary* glabrous, with a few long hairs near the apex; style glabrous; ovules 4. *Seeds* not seen.

15. **S. canaricus**, *Bedd. Ic. Pl. Ind. Or.* t. 215; leaves ovate acuminate subentire mature puberulous on the nerves beneath, spikes linear-oblong minutely cinereous-lanate, bracts ovate, corolla  $\frac{2}{3}$  in. white.



DECCAN PENINSULA; S. Canara, on the Kudra Mukh Mt., alt. 6000 ft., *Beddome*.

A rigid shrub, 3-4 ft.; tips of the branches and young leaves densely clothed with caducous yellowish wool. *Leaves* crowded towards the ends of the branches, 3 by  $1\frac{1}{2}$  in., base rhomboidal, mature nearly glabrous except the nerves beneath; nerves 9 pair, approximate, subparallel; petiole  $\frac{1}{2}$  in. *Spikes* 1-2 in., clustered in the upper axils, forming a dense terminal panicle, thinly, duskily, deciduously woolly; bracts  $\frac{1}{4}$ - $\frac{1}{2}$  in., ovate, obscurely acuminate; bracteoles scarcely  $\frac{1}{4}$  in., narrowly lanceolate. *Calyx*  $\frac{1}{4}$  in., divided half-way down; segments narrowly lanceolate. *Corolla* very pubescent, ventricose portion much longer than the cylindric base. *Filaments* hairy. *Ovary* glabrous, style minutely sparsely hairy; ovule solitary in each cell (in the only ovary examined), probably never as in *Beddome's* figure, which shows the ovules 2 in each cell, the lower pendulous.

16. ***S. cuspidatus***, *T. Anders. in Journ. Linn. Soc.* ix. 465; leaves ovate acuminate subentire densely white silky beneath, spikes linear oblong glandular fulvous hairy, bracts narrowly elliptic acuminate, corolla 1 in. blue-purple. *Bedd. Ic. Pl. Ind. Or.* t. 221. *Endopogon cuspidatus*, *Benth. in Pl. Hohenack.* n. 1169, and in *Linnæa*, xxiv. 646. *E. versicolor*, *Wight Ill.* t. 164 b. fig. 4 (left-hand); and *Ic.* t. 1497, both figure and description.

NILGHERRIES, alt. 4-7000 ft., frequent; *Wight, Gen. Munro, &c.*

A shrub, 2-5 ft. *Leaves* 4 by  $2\frac{1}{2}$  in., base shortly acuminate, mature glabrous above, raphides not prominent; nerves 8 pair, approximate, subparallel; petiole  $1\frac{1}{4}$  in. *Spikes* 1-3 in., often laxly paniced at the ends of the branches; bracts  $\frac{2}{3}$  in., base concave, acuminate, tip recurved; bracteoles  $\frac{1}{4}$  in., linear. *Calyx*  $\frac{1}{2}$  in., divided  $\frac{2}{3}$  the way down; teeth linear, very glandular-hairy (not so lanceolate as in *Beddome's* figure). *Corolla* nearly glabrous; 2 rows of long white hairs on the palate within, between which the style (itself nearly glabrous, not as in *Beddome's* figure) lies. *Filaments* glabrous, except near the base. *Capsule*  $\frac{1}{2}$  in., 4-seeded; seeds discoid, with a circular areola on each face, densely hairy except on the areola.—*T. Anderson* refers *Wight Ic.* t. 1497 to *S. viscosus*, but the plant from which that figure was drawn is at Kew, and is *S. cuspidatus*.

17. ***S. consanguineus***, *Clarke, not of T. Anders.*; leaves ovate acuminate obscurely toothed glabrous beneath, spikes linear-oblong glandular hairy, bracts narrowly elliptic hardly so long as the calyx, corolla  $\frac{2}{3}$  in. *S. neglectus*, *T. Anders. ms.* *Endopogon consanguineus*, *Nees in Wall. Pl. As. Rar.* iii. 99, and partly in *DC. Prodr.* xi. 104. *Ruellia spicata*, *Roth Nov. Sp.* 310; *Nees in DC. Prodr.* xi. 153.

S. MADRAS; Negapatam and Nilgherries, *Wight*; Courtallum, *Wight*, n. 1982.

Very similar to the last species; but the leaves are more distinctly toothed, the flowers smaller. *Leaves* glabrate, prominently lineolate above; nerves 7 pair. *Spikes* compound, axillary and terminal, often slender, sublinear. *Calyx*  $\frac{1}{2}$  in., divided half-way down or more; segments narrowly lanceolate, glandular-hairy. *Corolla-lobes* ovate, acute. *Filaments* glabrous, except at the very base. *Capsule*  $\frac{1}{4}$ - $\frac{1}{2}$  in., 4-seeded. *Seeds* discoid, areolate on both faces, densely hairy except on the areolæ.—This is the original *Endopogon consanguineus* of *Nees*, which was founded on *Wight* n. 1982, the example of which authenticated in *Nees' hand* is at Kew. Subsequently, in *DC. Prodr.*, *Nees* united with this species the totally remote *S. exareolatus*. *T. Anderson* published (in *Thwaites Enum.* 226) this latter species as *S. consanguineus*, *T. Anders.*, while he separated in the herbarium the old *Wight* n. 1982 on which he has written *S. neglectus*, nov. sp.

VAR. *Amomum*; leaves more clearly toothed, spikes slender minutely pubescent or very nearly glabrous, bracts acuminate to an obtuse apex often overtopping the calyx. *S. consanguineus*, *T. Anders. in Journ. Linn. Soc.* ix. 465, partly; *Bedd. Ic. Pl. Ind. Or.* t. 216. *Ruellia sesamoides*, *Wall. Cat.* 2408, c and a chiefly. *Endopogon Amomum*, *Nees in Wall. Pl. As. Rar.* iii. 99, and in *DC. Prodr.* xi. 104.—Nilgherries; *Wight*, n. 1980, &c.



VAR. *hypoleuca*; as Var. *Amomum*, but the leaves often (when young) silky white beneath. *Ruellia sesamoides*, *Wall. Cat.* 240 B. *Endopogon hypoleucus*, *Nees in Wall. Pl. As. Rar.* iii. 99, and in *DC. Prodr.* xi. 104. *E. viscosus*, *Nees*, Var. *humilis*, *Wight Ic.* t. 1498; *Nees in DC. Prodr.* xi. 104.—Mts of S. Madras, *Wight*; Bellary, *Beddome*.—A very trifling var. of the preceding Var. *Amomum*; but the Ceylon plant, the *S. hypoleucus* of T. Anderson, is the very different *S. rhytisperma*.

18. **S. jeyporensis**, *Bedd. Ic. Pl. Ind. Or.* t. 1214; leaves ovate acuminate crenulate mature nearly glabrous, spikes linear-oblong viscidly patently hairy, bracts lanceolate acuminate recurved, corolla  $\frac{1}{2}$  in. white.

S. DECCAN PENINSULA; Golconda in Vizigapatam, alt. 2500 ft., and Mts. in Jeypore, *Beddome*.

A large shrub. *Leaves*  $7\frac{1}{2}$  by 4 in., base shortly acuminate, mature densely obscurely lineolate above, thinly puberulous beneath; nerves 11 pair; petiole  $2\frac{3}{4}$  in. *Spikes* 1– $2\frac{1}{2}$  in., uninterrupted; bracts  $\frac{2}{3}$  in.; bracteoles  $\frac{1}{3}$  in., narrow. *Calyx*  $\frac{1}{2}$  in. and upwards, divided  $\frac{2}{3}$  the way down; segments linear from a short lanceolate base, patently hairy. *Corolla* nearly straight, ventricose portion of the tube much longer than the cylindric. *Ovary* 4-ovulate in *Beddome's* figure. *Capsule*  $\frac{1}{3}$  in., 2-seeded in *Beddome's* example. *Seeds* discoid, areolate on each face, densely hairy except on the areolæ.

\*\*\* *Species of the Khasia Hills.*

19. **S. adnatus**, *Clarke*; leaves widely elliptic acuminate at both ends subentire glabrous, spikes linear stout dense strobiliform, bracts ovate acute adnate, calyx and corolla small. *S. decurrens*, *T. Anders. in Journ. Linn. Soc.* ix. 470, not of *Nees* (in *DC. Prodr.* xi. 189). *Endopogon decurrens*, *Nees in DC. Prodr.* xi. 105.

KHASIA MTS., alt. 3–5000 ft., frequent; *Griffith, H. f. & T., &c.* UPPER ASSAM; *Jenkins*.

A shrub, 2–4 ft., nearly glabrous. *Leaves* 6 by  $2\frac{1}{4}$  in.; nerves 10 pair; petiole  $1\frac{1}{4}$  in. *Spikes* 3–5 in., axillary and terminal in short dense panicles; bracts  $\frac{3}{4}$  by  $\frac{1}{3}$  in., glabrous, ciliate, persistent, reticulate, scarious; bracteoles 0. *Calyx* scarcely  $\frac{1}{3}$  in., divided nearly to the base into linear segments. *Corolla*  $\frac{1}{3}$ – $\frac{1}{2}$  in., glabrous without. *Stamens* 2; glabrous except at their point of attachment, 2 linear rudiments added. *Capsule*  $\frac{1}{3}$  in., 4-seeded. *Seeds* ovate, glistening, glabrous, hairless, without lateral areoles.

20. **S. khasyanus**, *T. Anders. in Journ. Linn. Soc.* ix. 471; hirsute, leaves ovate acuminate toothed, spines axillary clustered linear lax, bracts linear-spathulate as long as the calyx, corolla slender white. *Endopogon khasyanus*, *Nees in DC. Prodr.* xi. 104.

KHASIA MTS., alt. 2–4000 ft.; *Griffith, H. f. & T., &c.* SIKKIM; Darjeeling (*Herb. Griffith*).

A shrub, 2–4 ft., densely patently brown-hairy, somewhat glandular-viscid. *Leaves* 4 by 2 in., shortly narrowed into the petiole, strongly crenate or subserrate, mature hirsute on both surfaces; nerves 9 pair; petiole  $1\frac{1}{4}$  in. *Spikes* 1–4 in., forming axillary tufts of unequal length, linear but scarcely interrupted; bracts  $\frac{1}{4}$ – $\frac{1}{3}$  in.; bracteoles  $\frac{1}{4}$  in., linear. *Sepals*  $\frac{1}{4}$  in., linear, somewhat enlarged in fruit. *Corolla-tube*  $\frac{1}{2}$  in., linear, funnel-shaped only towards the top, lobes  $\frac{1}{4}$ – $\frac{1}{3}$  in., roundish, patent. *Filaments* glabrous, unless at the very base, anthers much exsert. *Capsule*  $\frac{1}{3}$  in., 4-seeded. *Seeds* ovate, with an areola on each side; hairy (except on the areoles) with adpressed hairs inelastic when wetted.

Subgenus 3. **Eustrobilanthes**. Calyx deeply subequally 5-fid. *Stamens* 4, perfect; anthers not very unequal.



Series A. *Bracteata*. Bracts prominent, persistent or only late deciduous. Flowers spiked, clustered or strobilate; spikes sometimes interrupted below, but flowers never all scattered.

\* *Flowers capitate or shortly spicate*. (An artificial section passing by gradations into the strobiliform or interruptedly spicate sections.)

† *Seeds glabrous* (in a few not known).—Species of Ceylon and the Deccan Peninsula.

21. **S. barbatus**, *Nees in Wall. Pl. As. Rar.* iii. 85, and in *DC. Prodr.* xi. 179; leaves broad-elliptic acuminate at both ends glabrous, bracts obovate cuspidate squarrose, corolla white very hairy within, seeds usually 2. *T. Anders. in Journ. Linn. Soc.* ix. 468; *Bedd. Ic. Pl. Ind. Or.* t. 212. *S. tetrapterus*, *Dalz. in Hook. Kew Journ.* ii. 342; *Dalz. & Gibs. Bomb. Fl.* 187; *T. Anders. in Journ. Linn. Soc.* ix. 468. *Ruellia ciliata*, *Heyne in Herb. Rottler; Wall. Cat.* 2392 (not *Wall. Cat.* 2415).

W. DECCAN PENINSULA; from the Bombay Ghats to Cape Comorin, alt. 3000 ft., *Wight, Dalzell, &c.*

A gregarious shrub, flowering once at about 7 years old, then dying (Beddome); stem often winged. Leaves 7 by 3 in., crenulate or subentire, lineolate especially above; nerves 7–8 pair; petiole 1–3 in., base often auriculate, sometimes winged. Heads 1–2 in., sessile, very dense; bracts  $\frac{3}{4}$  in., obscurely quadrifarious, green, ciliate; bracteoles  $\frac{1}{2}$  in., linear, ciliate. Calyx  $\frac{1}{3}$  in., divided more than half-way down, green, ciliolate; segments linear-lanceolate. Corolla  $\frac{3}{4}$ –1 in.; cylindric base as long as the suddenly-widened subcampanulate portion; limb nearly erect, subequal. Filaments sparsely hairy upwards. Pistil sparsely hairy and glabrous. Capsule  $\frac{1}{2}$ – $\frac{2}{3}$  in., clavate, always 2-seeded. Seeds nearly  $\frac{1}{4}$  in. long, very thin, elliptic, areoles 0.—The fruit has only been seen in the form *S. tetrapterus*, *Dalz.* In the old examples of *S. barbatus* the corolla is barely  $\frac{1}{2}$  in., the heads and bracts are smaller, the calyx less deeply divided; but Beddome says (from knowledge of the living plant) that there is only one species here.

22. **S. lanceolatus**, *Nees in DC. Prodr.* xi. 181; glabrous except the calyx, leaves lanceolate acuminate at both ends nearly entire, heads small capitate few-fld., calyx-segments in flower lanceolate acute slightly hairy in fruit, capsule 4-seeded. *S. adenophorus*, *Nees l. c.* 182; *T. Anders. in Thwaites Enum.* 228, and in *Journ. Linn. Soc.* ix. 466, not of Beddome. *Martynia lanceolata*, *Moon Cat. Pl. Ceyl.* *Goldfussia Myrtinia*, *Nees l. c.* 174.

CEYLON; Four Korles and Saffragam, *Macrae, Thwaites, &c.*

A small shrub; branches quadrangular. Leaves 3 by  $\frac{3}{4}$  in., prominently lineolate above; nerves 6 pair; petiole  $\frac{1}{2}$  in. Heads  $\frac{1}{2}$  in. (exclusive of the corolla), 2–4-fld., in appearance solitary peduncled, peduncles slightly thickened upwards quadrangular or subulate; floral leaves 2, elliptic,  $\frac{1}{2}$  in., in the dried examples erect, overtopping closely enveloping the flower-head; proper bract  $\frac{1}{3}$  in., oblong; bracteoles 2,  $\frac{1}{4}$  in., sublinear, often suppressed in the upper flowers as commonly in close heads. Calyx  $\frac{1}{3}$  in., divided half-way down, segments in fruit elongate obtuse. Corolla  $1\frac{1}{4}$ – $1\frac{1}{2}$  in., nearly glabrous without, light-blue; cylindric nearly as long as the ventricose part. Filaments hairy downwards. Ovary hairy at the apex. Capsule  $\frac{2}{3}$  in., narrowly oblong. Seeds  $\frac{1}{6}$  in. long, thin, elliptic, glabrous; areoles  $\frac{1}{3}$  the length of the seed.

23. **S. heteromallus**, *T. Anders. ms.*; villous, subhispid, leaves ovate acute, heads ovoid, bracts oblong overtopping the calyx, ovary densely hairy at the tip. *S. scaber*, Var.  $\gamma$  *Nees in Wall. Pl. As. Rar.* iii. 84, Var.  $\beta$  *Nees in DC. Prodr.* xi. 178, as to *Wight's Deccan material*. *Ruellia scabra*, *Wall. Cat.* 2377 (not *Wall. Cat.* 2393).



NILGHERRIES; Canoor, *Wight* (nn. 1945, 2207, herb. propr.).

A coarsely hairy shrub, resembling *S. Wightianus*. *Leaves* attaining  $5\frac{1}{2}$  by  $3\frac{1}{2}$  in. (mostly much smaller), base obtuse shortly decurrent on the petiole, nearly entire, thick, rugose, upper surface subhispid with hairs from tubercular bases, under villous; nerves 7-8 pair; petiole  $1\frac{1}{2}$  in. *Heads* sessile, 1 in., dense, hairy; bracts  $\frac{3}{4}$ -1 in., erect; bracteoles  $\frac{2}{3}$  in., sublinear. *Calyx*  $\frac{1}{2}$  in. or more, divided more than half-way down; segments linear-lanceolate, hairy upwards. *Corolla* 1 in., glabrous without, hairy within, subsymmetric, cylinder portion of the tube as long as the ventricose. *Stamens* 4; filaments very hairy at the base. *Ovary* dense fulvous-hairy at the tip; style sparsely hairy; ovules 4. *Capsule* scarcely  $\frac{1}{3}$  in., narrowly ellipsoid, 2- or 4-seeded. *Seeds* more than  $\frac{1}{8}$  in., glabrous; areoles 0.—This in the dry state greatly resembles *S. Wightianus*, but the ovary, style and seeds differ. Col. Beddome says the shrub is well known to him at Canoor, but has not flowered during his whole residence in the Nilgherries.

24. ***S. Wightianus***, *Nees in Wall. Pl. As. Rar.* iii. 86, and in *DC. Prodr.* xi. 180; coarsely hairy, leaves ovate, heads ovoid, bracts elliptic-acuminate overtopping the calyx, ovary glabrous at the tip, capsule 4-seeded. *Wight Ic.* t. 1514; *T. Anders. in Journ. Linn. Soc.* ix. 466.

NILGHERRY MTS., alt. 7-8000 ft., frequent; *Gardner, Wight, Gen. Munro, &c.*

*Stems* 2-3 ft., stout, often almost shaggy. *Leaves*  $1\frac{1}{2}$ -2 by 1 in., obtuse, base shortly cuneate, thick, rugose. *Bracts*  $\frac{3}{4}$ -1 in., acute; bracteoles  $\frac{2}{3}$  in., linear-spathulate. *Calyx*  $\frac{2}{3}$  in., divided nearly to the base; segments linear-oblong, sub-obtuse, softly hairy; in fruit somewhat membranous nervose. *Corolla*  $\frac{3}{4}$ -1 in., blueish, nearly glabrous without, with hairy lines within; cylindric base of the tube much shorter than the ventricose part. *Ovary* glabrous; style sparsely hairy. *Capsule*  $\frac{1}{3}$  in., oblong, 4-seeded. *Seeds*  $\frac{1}{10}$  in. long, thin, elliptic, glabrous; areoles 0—Otherwise as the preceding species, which *Wight* appears to have included under *Wightianus*.

25. ***S. pulneyensis***, *Clarke*; hirsute, leaves ovate shortly acute, heads subglobose abbreviated dense with foliaceous bracts, style-base patently hairy, corolla-tube with long linear-cylindric base. *S. punctatus*, *Bedd. Ic. Pl. Ind. Or.* t. 204 in note, not of *Nees*.

S. DECCAN; Pulney Hills and Anamallays, *Beddome*.

Resembling *S. Wightianus*, but with a differently shaped corolla. *Leaves* 3 by 2 in., base rounded or cuneate, crenate, thick, tubercular-hairy above, more softly hairy beneath; petiole  $1\frac{1}{2}$  in. *Heads* much depressed, as if into flattened rosettes, the rounded bracts patent on all sides; bracteoles  $\frac{1}{2}$ - $\frac{2}{3}$  in., linear-lanceolate. *Calyx*  $\frac{1}{2}$ - $\frac{2}{3}$  in., divided more than half-way down; segments linear-lanceolate, hairy. *Corolla* 1 in., somewhat hairy in the bud; cylindric base as long as the ventricose part. *Filaments* glabrous, except at the base. *Ovary* slightly patently hairy towards the apex, 4-ovulate. *Capsule* not seen.—Communicated by Col. Beddome as probably *Ruellia* ? punctata of *Wight*, which differs very considerably. In the absence of seeds, it is placed by guess next *S. Wightianus*.

26. ***S. neilgherrensis***, *Bedd. Ic. Pl. Ind. Or.* t. 196; hirsute, sub-hispid, leaves large ovate acuminate, heads ovoid, bracts narrow-oblong, bracteoles and calyx-segments in fruit elongate caudate patently bristly, capsule 4-seeded.

S. DECCAN, common in the mountains, Nilgherries, Pulneys, Coorg, &c., *Beddome*.

A shrub, general aspect of *S. Perrottetianus*. *Leaves* 6 by  $3\frac{1}{2}$  in., base obtuse, crenate, coarsely hispid with white or yellow hairs from tubercular bases; nerves 8 pair; petiole 1-2 in. *Heads* sessile, capitate, not elongate even in fruit; bracts 1 by  $\frac{1}{6}$  in.; bracteoles at flower-time  $\frac{1}{2}$  in., linear, in fruit elongate very long-tailed. *Sepals*  $\frac{1}{3}$  in.; in fruit at least 1 in., base lanceolate with leaden glabrous scarious margins.



*Corolla*  $1\frac{1}{4}$ – $1\frac{1}{2}$  in., glabrous without, white (Beddome), cylindric base nearly as long as the urceolate part. *Filaments* hairy, especially downwards. *Style* sparsely patent hairy. *Capsule*  $\frac{2}{3}$  in., oblong ellipsoid. *Seeds* thin, obovate, obtuse, glabrous; areoles 0.—Beddome says “ovary very hairy at the apex,” but in his figure and specimens it is very slightly so. Possibly the note applied to *heteromallus*?

27. **S. Perrottetianus**, *Nees in DC. Prodr.* xi. 179; rufous-hirsute, leaves ovate acuminate, heads ovoid or subclavate, bracts ovate acute overtopping the calyx, capsule 2-seeded. *Wight Ic.* t. 1513; *T. Anders. in Journ. Linn. Soc.* ix. 466.

NILGHERY MTS., alt. 6–8000 ft., frequent; *Wight, &c.*

*Stem* 2–3 ft. *Leaves*  $4\frac{1}{2}$  by  $2\frac{1}{2}$  in. (often smaller), base broadly rhomboid, crenate; nerves 7 pair; petiole  $1\frac{1}{2}$  in. *Heads* 1–2 in., often wider upwards, or substrobiliform, hirsute, in appearance peduncled or paniced, but the two outermost bracts are empty, and more or less leafy; bracts  $\frac{3}{4}$  in.; bracteoles  $\frac{1}{3}$  in., linear. *Calyx*  $\frac{3}{4}$  in., divided  $\frac{2}{3}$  the way down, subscarious with numerous red hairs; segments sublinear, acute. *Corolla* 1 in., pale-lilac, subsymmetric; narrow portion of the tube short; glabrous without. *Filaments* hairy. *Ovary* glabrous; base of style patent hairy. *Capsule*  $\frac{1}{2}$  in., oblong-ellipsoid, 2-seeded. *Seeds*  $\frac{1}{4}$  in. long and upwards, very thin, ovate, not hairy, but minutely scabrous-lamellate; areoles 0.

28. **S. Zenkerianus**, *T. Anders. in Journ. Linn. Soc.* ix. 467; glabrous except the fruiting calyx-tips, leaves ovate shortly acuminate, spikes ovoid or oblong, bracts narrowly elliptic-oblong overtopping the calyx, capsule 4-seeded. *Goldfussia Zenkeriana*, *Nees in DC. Prodr.* xi. 172. *G. Leschenaultiana*, *Nees l. c.* ? *Endopogon Strobilanthes*, *Wight Ic.* t. 1500.

NILGHERY MTS., alt. 6–8000 ft., frequent; *Sir F. Adam, Schmidt, Wight, &c.*

A shrub, 2–3 ft., much resembling *S. foliosus* (n. 8), and really closely allied to it. *Leaves* 3 by  $1\frac{3}{4}$  in., base cuneate, serrulate, upper surface prominently lineolate; nerves 7 pair; petiole  $1\frac{1}{2}$ –2 in. *Spikes* 1– $2\frac{1}{2}$  in., young globose or oblong, mature oblong; bracts  $\frac{3}{4}$  in.; bracteoles  $\frac{2}{3}$  in., sublinear. *Calyx*  $\frac{1}{2}$ – $\frac{2}{3}$  in., divided nearly to the base; segments linear-lanceolate, glabrous or in the fruiting examples with scattered patent gland-tipped hairs. *Corolla*  $1\frac{1}{2}$  in., blueish, glabrous without; cylindric nearly as long as the ventricose part. *Filaments* hairy in their lower half. *Pistil* glabrous or nearly so. *Capsule*  $\frac{1}{2}$  in., oblong-ellipsoid. *Seeds*  $\frac{1}{3}$  in. long, very thin, elliptic, glabrous; areoles 0.

29. **S. warreensis**, *Dalz. in Hook. Kew Journ.* ii. 341; leaves broad-lanceolate acuminate at both ends glabrous, spikes oblong hairy, calyx greatly enlarged in fruit, corolla  $\frac{1}{2}$  in., capsule 4-seeded. *Dalz. & Gibs. Bomb. Fl.* 187. *S. ciliatus*, *T. Anders. in Journ. Linn. Soc.* ix. 468, partly. *S. parviflorus*, *Bedd. Ic. Pl. Ind. Or.* t. 197.

W. DECCAN PENINSULA; near Belgaum, Warree country, *Dalzell*; Ram Ghaut, *Ritchie*; Coorg and S. Canara, alt. 3000 ft., *Beddome*.

Shrub, 2–5 ft. *Leaves* 6 by 2 in., much acuminate, crenate, lineolate on both surfaces; nerves 7 pair; petiole  $\frac{2}{3}$  in. *Spikes* 1–2 in., peduncles hairy, erect in fruit; bracts (flowering)  $\frac{1}{4}$ – $\frac{1}{3}$  in., elliptic, hairy; bracteoles  $\frac{1}{3}$  in., linear. *Calyx* (flowering)  $\frac{1}{4}$  in., divided nearly to the base; segments linear pubescent upwards. *Corolla* straight, nearly symmetric, glabrous, linear-cylindric about as long as the subcampanulate portion; white purple-spotted. *Filaments* hairy below, not more monadelphous than in many other species. *Pistil* glabrous. *Capsule*  $\frac{1}{2}$  in., clavate-oblong; fruit-sepals  $\frac{3}{4}$  in., narrowly oblong, hairy. *Seeds*  $\frac{1}{3}$  in. long, thin, elliptic, glabrous; areoles 0.—The extraordinary enlargement of the calyx in fruit was noted by Dr. Ritchie, whose examples have flowering and fruiting spikes on the same branch.

30. **S. ciliatus**, *Nees in Wall. Pl. As. Rar.* iii. 85, and in *DC. Prodr.*



xi. 183; glabrous, leaves broad-lanceolate acuminate at both ends, spikes small oblong often deflexed at flower-time, corolla small. *T. Anders. in Journ. Linn. Soc.* ix. 468, partly; *Bedd. Ic. Pl. Ind. Or.* t. 211. *Ruellia ciliata*, *Wall. Cat.* 2415 (not *Wall. Cat.* 2392). *Goldfussia Zenkeriana*, *Wight Ic.* t. 1517?, not of *Nees*.

S. DECCAN PENINSULA; the Ghauts up to 4000 ft., common, *Beddome*; Nilgherries, Mangalore, &c., Courtallum, *Wight* (n. 1949, *Herb. Propr.*).

Resembling *S. warreensis* in leaves and spikes; but the peduncles and bracts are perfectly glabrous, the spikes slenderer. *Corolla* in the dried examples  $\frac{1}{2}$ – $\frac{2}{3}$  in.; *Wight's* figure shows them very much too large; *Beddome* figures (and describes) them an inch, but his description appears largely taken from *S. warreensis*.

31. **S. adenophorus**, *Bedd. Ic. Pl. Ind. Or.* t. 225, not of *Nees* nor of *T. Anders.*; glabrous, leaves lanceolate acuminate at both ends subentire, heads oblong, bracts obovate, calyx-segments lanceolate subobtuse.

S. DECCAN; Anamallay Mts., alt. 4–5000 ft., *Beddome*.

Shrubby, 3–4 ft. *Leaves* 4 by 1 in., conspicuously lineolate above; nerves 6 pair, slender; petiole  $\frac{1}{2}$  in. *Heads* 1–2 in., often deflexed; bracts  $\frac{1}{3}$ – $\frac{1}{2}$  in., obtuse, sometimes mucronate, glabrous, lineolate; bracteoles  $\frac{1}{4}$  in., narrowly ligulate. *Calyx* nearly  $\frac{1}{2}$  in., divided about half-way down; segments membranous. *Corolla* 1–1 $\frac{1}{4}$  in., glabrous without, very hairy within, nearly straight; cylindric rather shorter than the urceolate part. *Filaments* hairy downwards. *Pistil* glabrous. *Capsule* not seen.—*Beddome* says that *T. Anderson* identified this plant with the Ceylon *S. lanceolatus*, but there must have been some mistake, as except in the leaves there is little resemblance between the two. In its habit, deflexed peduncles, and bracts, this seems very nearly allied to *S. ciliatus*, *Nees*, but in the absence of seeds it is hazardous to guess at affinity.

32.? **S. decurrens**, *Nees in DC. Prodr.* xi. 189; glabrous, leaves elliptic acuminate at both ends, spikes clavate-oblong, bracts large narrowly elliptic obtuse decurrent. *S. pallidus*, *T. Anders. in Journ. Linn. Soc.* ix. 470. *Goldfussia decurrens*, *Wight Ic.* t. 1522 (not *Endopogon decurrens*, *Nees*).

S. DECCAN; Coimbatore, Courtallum and Nilgherries, *Wight*; Anamallays, *Beddome*.

Herbaceous (fide *Wight*), green. *Leaves* 7 by 2 $\frac{1}{2}$  in., entire or obscurely crenate, conspicuously lineolate above; nerves 10 pair; petiole 1 in. *Peduncles* 1–2 in., slightly thickened upwards, quadrangular or subulate, divaricate or deflexed, often with 2 bract-like leaves below the head; heads 1 $\frac{1}{2}$  in., tapering at the base; bracts 1 by  $\frac{1}{3}$  in. bracteoles  $\frac{1}{3}$  in., linear-ligulate. *Calyx*  $\frac{1}{3}$  in., subscarious, divided more than half-way down, segments lanceolate. *Corolla* 1 $\frac{1}{4}$  in., glabrous without; cylindric portion scarcely so long as the ventricose. *Filaments* hairy downwards. *Pistil* glabrous. *Capsule* not seen.—This species is placed here from its similarity to *S. ciliatus* and *S. adenophorus*.

†† *Seeds hairy.*

¶ *Species of the Deccan Peninsula and Ceylon.*

33. **S. Walkeri**, *Nees in DC. Prodr.* xi. 181; nearly glabrous, leaves broadly elliptic acuminate at both ends, spikes ovoid few-fl. cymose, bracts ovate adnate obtuse bullate, capsule with 2 very large seeds. *Bedd. Ic. Pl. Ind. Or.* t. 222; *T. Anders. Thwaites Enum.* 227, and in *Journ. Linn. Soc.* ix. 470.

CEYLON; alt. 4–7000 ft., *Walker*, &c.

A shrub, 6 ft., gregarious, flowering when about six years old, then dying. *Leaves* 6 $\frac{1}{2}$  by 2 $\frac{3}{4}$  in., crenate, minutely sparsely scabrid-pubescent; nerves 7–8 pair; petiole



1½ in. *Cymes* often of 3 heads, sometimes compound; peduncles clavellulate or winged; heads ⅔ in., 2–4 fld., enveloped by the two outer bract-like erect leaves; proper bracts ½ in., green, slightly ciliate; bracteoles ¼ in., sublinear. *Sepals* ⅓ in., linear-lanceolate, obtuse, scarious, nearly glabrous. *Corolla* ¾ in., subsymmetric, glabrous without, hairy within, white or purplish; contracted base short. *Filaments* hairy at the base. *Pistil* glabrous. *Capsule* ¾ in., ellipsoid. *Seeds* nearly ½ in., very thin, ovate, shaggy with adpressed wavy silky hair not elastic in water; areoles 0.—Beddome's figure shows the corolla within and filaments glabrous, which they may be sometimes, for it is not a very constant character in *Strobilanthes*; but none of the numerous specimens are so.

VAR. ? *stenocarpa*; leaves broadly ovate pubescent beneath somewhat flaccid, capsules ½ in. 2-seeded, seeds ⅓ in. shaggy with silky hair, areoles hardly any.—Ceylon; Thwaites, C. P. n. 3517. This probably differs specifically from *S. Walkeri*, the difference in the size of the fruit being startling; but it must stand next to it.

34. **S. Thwaitesii**, T. Anders. in *Thwaites Enum.* 227, and in *Journ. Linn. Soc.* ix. 470; leaves elliptic acuminate at both ends scabrous pubescent beneath, spikes oblong few-fld. cymose, bracts sessile elliptic elongate acute bullate. *Bedd. Ic. Pl. Ind. Or.* t. 219.

CEYLON; Ambagamowa, *Thwaites*.

A shrub, 4–5 ft. *Leaves* 6½ by 2½ in., crenulate, subcoriaceous, mature glabrate above fuscous pubescent beneath; nerves 7 pair; petiole 1¼ in. *Peduncles* fascicled or cymose, thickened upwards, more or less pubescent; outermost empty bracts ¼ in., ovate; bract proper nearly 1 in., ciliate; bracteoles ½ in., linear. *Calyx* ½ in., divided ⅔ the way down; segments narrowly lanceolate, ciliate. *Corolla* exceeding 1 in., subsymmetric, white, glabrous without, hairy within; linear-cylindric base of the tube hardly so long as the campanulate part. *Filaments* and *style* sparsely hairy. *Capsule* not seen.

35. **S. caudatus**, T. Anders. in *Thwaites Enum.* 228, and in *Journ. Linn. Soc.* ix. 470; leaves lanceolate caudate-acuminate fuscous-pubescent beneath, heads oblong fuscous-villous, bracts oblong, corolla nearly glabrous within. *Bedd. Ic. Pl. Ind. Or.* t. 213.

W. DECCAN PENINSULA; S. Canara, 2–6000 ft., *Beddome*; common also in Koorg and Wynaad, fide *Beddome*. CEYLON; Hantani, *Thwaites* (C. P. n. 364).

A shrub, 4–5 ft. *Leaves* 6 by 1¼ in., base tapering, subentire, mature glabrate lineolate above; nerves 10–12 pair; petiole ½ in. *Peduncles* 1–2 in., hairy, divaricate, carrying 1–3 nodding spikes ½–1½ in. long; bracts ½ in., oblong; bracteoles ⅓ in., narrowly oblong. *Calyx* nearly ½ in., oblong, softly brown-hairy, divided nearly to the base; segments sublinear, obtuse. *Corolla* ¾–1 in., nearly glabrous, white tinged orange or reddish; cylindric portion shorter than the ventricose; limb suboblique, segments short round. *Filaments* glabrous. *Ovary* scabrous, slightly glandular-hairy; style thinly hairy. *Capsule* ⅔ in., broadly ellipsoid, fuscous-pubescent, 2-seeded. *Seeds* ¼ in. diam., rufous, inelastically shaggy; areoles small.—Col. *Beddome's* Malabar plant has rather longer hairs on the stem and leaves than the Ceylon.

VAR. *laniceps*; tips of the branchlets purple, peduncles and spikes densely white with patent hairs ⅛–¼ in. long, corolla 1¼ in. very hairy within, filaments hairy.—Ceylon; *Thwaites*.—Sent by Thwaites, numbered 364, subsequently to the rest of n. 364, and probably not seen by T. Anderson before Thwaites' *Enum.* was published.

36. **S. tristis**, T. Anders. in *Journ. Linn. Soc.* ix. 470; leaves elliptic acuminate at both ends nearly glabrous, heads oblong 2–3-fld. paniced, bracts elliptic acuminate overtopping the densely hairy calyx-teeth, capsule 2-seeded. *Goldfussia tristis*, *Wight Ic.* t. 1508.

NILGHERRIES; *Gardner*; below Sispara, *Wight*. S. TINNEVELLY; *Beddome*.



An erect shrub. *Leaves* 7 by  $2\frac{1}{2}$  in., crenate, lineolate on both surfaces; nerves 6-7 pair beneath, minutely scabrid; petiole 2 in. *Heads* several (sometimes 35) to the panicle; panicle branches slender, glabrescent; outermost pair of pollen bracts usually  $\frac{1}{4}$  in., lanceolate, next pair resembling the proper bracts but empty, patently glistening hairy or quite glabrous; bract proper  $\frac{3}{4}$  in., sessile, green; bracteoles 0. *Sepals* nearly  $\frac{1}{2}$  in., linear, scarious below, terminating in a dense tuft of multicellular hairs. *Corolla* 1 in., subsymmetric, pale-blue, hairy within; ventricose portion longer than the contracted; segments round. *Filaments* hairy towards the base. *Style* sparsely hairy. *Capsule*  $\frac{1}{2}$  in., narrowly ellipsoid. *Seeds*  $\frac{1}{4}$  in., thin, subquadrate elliptic, shaggy with adpressed wavy silky hair not elastic when wetted, glabrous on the oblong large areoles.

37. **S. anceps**, *Nees in DC. Prodr.* xi. 189; thinly hairy, leaves ovate acuminate, heads small oblong, bracts obovate obtuse tips green squarrose or reflexed. *T. Anders. in Journ. Linn. Soc.* ix. 466; *Bedd. Ic. Pl. Ind. Or.* t. 204.

CEYLON; alt. 3-6000 ft., frequent, *Gardner, &c.*

A small undershrub, much branched. *Leaves* 3 by  $1\frac{1}{4}$  in., obtuse or acuminate at the base, subentire, with scattered hairs and occasionally a few red glands beneath; nerves 6 pair; petiole  $\frac{1}{3}$  in. *Peduncles* 0- $1\frac{1}{2}$  in., numerous, often in clusters of 3, thickened upwards, 1-headed; heads  $\frac{1}{2}$  in., ovoid, in fruit often 1-2 in. oblong; bracts  $\frac{1}{4}$ - $\frac{1}{2}$  in., adpressed downwards often densely red, glandular, tips prominently reflexed; bracteoles  $\frac{1}{4}$  in., linear. *Calyx*  $\frac{1}{4}$  in., divided nearly to the base; segments linear, thin, hairy, much enlarged in fruit. *Corolla*  $\frac{3}{4}$  in., slightly pubescent without, slightly hairy within, straight, subsymmetric, white; contracted base much shorter than the urceolate portion, segments rounded. *Filaments* with long hairs. *Ovary* densely glandular at the tip, style glabrous. *Capsule*  $\frac{1}{3}$  in., oblong, pubescent, 4-seeded. *Seeds*  $\frac{1}{10}$  in., ovoid, closely hairy with short thick annulate hairs, elastically springing out when wetted.

*VAR. microstachya*; leaves and heads more hairy less glandular, calyx very small, corolla more hairy without. *S. macrostachya*, *Benth. in Flora* 1849, 557. *Ruellia?* *punctata*, *Nees in DC. Prodr.* xi. 147; *Wight Ic.* t. 1563.—Hills of S. Deccan; Courtallum, *Wight*; Mangalore, *Hohenacker*, n. 463; Anamallays, *Beddome*. Leaves 5 in.; filaments nearly glabrous. *Beddome* says that this plant is "very scabrous, the hairs arising from harsh papillæ." *Wight's* figure of *Ruellia? punctata* is drawn from his *Herb. Propr.* n. 656, preserved at Kew, written up by *Wright*, and quoted by *Nees*; but it is a particularly softly hairy form. As *Beddome* remarks, it is not taken up by *T. Anderson*.

*VAR. ? punctata*, *T. Anders. in Thwaites Enum.* 229; leaves small ovate glabrous densely glandular beneath, bracts orbicular glabrous ciliated densely glandular tips not reflexed. *Strobilanthes punctatus*, *Nees in DC. Prodr.* xi. 182 (sp.), *not of Bedd.*—Ceylon; *Walker*. Leaves  $\frac{1}{2}$ - $1\frac{1}{4}$  in., subobtuse, base often subcordate. Perhaps specifically distinct, but there is only one example, without fruit, named by *Nees*.

38. **S. Arnottianus**, *Nees in DC. Prodr.* xi. 179; softly laxly hairy, leaves cordate-ovate acute, heads obovoid nodding, bracts ovate acuminate, corolla subcampanulate lobes somewhat acute. *T. Anders. in Thwaites Enum.* 228, and in *Journ. Linn. Soc.* ix. 466; *Bedd. Ic. Pl. Ind. Or.* t. 261.

CEYLON; Newera Ellia, *Walker, &c.*

An undershrub, branches hirsute upwards. *Leaves* 4 by 2 in., crenate-serrate, thinly hairy on both surfaces; nerves 4-5 pair; petiole 1-2 in. *Heads*  $\frac{1}{2}$ -1 in., white-hairy; bracts  $\frac{1}{2}$ - $\frac{2}{3}$  in., sessile; bracteoles  $\frac{1}{3}$ - $\frac{1}{2}$  in., linear-oblong. *Calyx*  $\frac{1}{3}$ - $\frac{1}{2}$  in., divided nearly to the base; segments linear-lanceolate. *Corolla*  $\frac{2}{3}$  in., straight, symmetric, almost funnel-shaped from the very short contracted base, slightly hairy within and without, whiteish. *Filaments* attached very low down the corolla, glabrous; anthers exserted. *Ovary* and *style* hairy. *Capsule* 4-seeded; seeds (unripe) hairy.



—The segments of the corolla are ovate, longer and much more acute than in Beddome's figure.

39. **S. asperrimus**, *Nees in DC. Prodr.* xi. 183; leaves broadly elliptic acuminate at both ends hairy, heads paniced, bracts elliptic concave glabrous, bracteoles 0. *S. lupulinus*, *T. Anders. in Journ. Linn. Soc.* ix. 469, *partly*. *S. Hookeri* Var.  $\beta$ , *Nees l. c.* 185.

CEYLON; *Walker, Gardner, &c.*

Apparently a large shrub; branches swollen at the joints, scabrous, hirsute upwards. *Leaves* 9 by 4 in., crenate; nerves 11 pair; petiole  $1\frac{1}{2}$  in. *Panicles* in Walker's examples very compound; heads  $1-1\frac{1}{2}$  in., broadly oblong; bracts  $\frac{3}{4}$  in. *Calyx* less than  $\frac{1}{2}$  in., divided nearly to the base; segments ligulate, scarious, lineolate. *Corolla*  $\frac{3}{4}$  in., little contracted below, subsymmetric, glabrous without, hairy within. *Capsule*  $\frac{1}{2}$  in., 4-seeded. *Seeds*  $\frac{1}{8}$  in., thin, suborbicular, densely elastically hairy on the margin, areoles very large extended over all the seed but the margin.

40. **S. trifidus**, *Nees in DC. Prodr.* xi. 185; nearly glabrous, leaves elliptic acuminate, heads globose solitary or in small cymes, bracts ovate or elliptic concave, bracteoles 0. *S. tener*, *Nees l. c.* 184. *S. coloratus*, *Nees l. c.* 86, *not of T. Anders.* *S. lupulinus*, *T. Anders. in Thwaites Enum.* 228, and in *Journ. Linn. Soc.* ix. 469, *partly*.

CEYLON, frequent; *Gardner, &c.*

Regarded by T. Anderson as a glabrescent form of *S. asperrimus*, which it may be, but the capsule is unknown and the inflorescence much less compound. *Leaves* 3-10 in., base attenuated or rounded, drying black. *Bracts* membranous, the upper even in the young heads often coloured membranous.

41. **S. lupulinus**, *Nees in Wall. Pl. As. Rar.* iii. 85, and in *DC. Prodr.* xi. 184; hairy, leaves elliptic acuminate at both ends, spikes in small dense cymes, bracts elliptic obtuse concave softly hairy, bracteoles obsolete. *S. Dalzellii*, *T. Anders. ms. in Herb. Kew.* *Ruellia lupulina*, *Wall. Cat.* 2355 *a & c.*

W. DECCAN PENINSULA; Concan, *Dalzell, Stocks*; Ram Ghaut near Belgaum, *Ritchie.* COURTALLUM; *Wight.*

*Branches* stout, woody, hairy upwards. *Leaves* 6 by 2-3 in., denticulate, laxly villous on both surfaces or subsetulose above; nerves 8 pair; petiole  $1\frac{3}{4}$  in. *Peduncles* axillary, very short; spikes  $1\frac{1}{2}$  in., oblong, subumbellate or solitary; bracts  $\frac{2}{3}-1$  in. *Calyx*  $\frac{1}{4}-\frac{1}{3}$  in., divided nearly to the base; segments ligulate, obtuse, scarious, glabrous, tips bristly. *Corolla*  $\frac{3}{4}-1$  in., glabrous without, hairy within, straight, subsymmetric; cylindric part as long as the suburceolate, lobes short. *Filaments* hairy downwards. *Pistil* glabrous or the style upwards microscopically hairy. *Capsule* scarcely  $\frac{1}{3}$  in., oblong, 4-seeded. *Seeds*  $\frac{1}{8}$  in., elliptic, elastically white hairy only on the very margin.—The Bombay botanists took this species for a hairy-bracteate form of *S. rugosus* (*Wight Ic. t.* 1619).

42. **S. Heyneanus**, *Nees in Wall. Pl. As. Rar.* iii. 85, and in *DC. Prodr.* xi. 184; leaves broadly elliptic acuminate at both ends hairy, spikes subglobose cymose, bracts elliptic ventricose glabrous, bracteoles 0, corolla  $\frac{3}{4}$  in. *Dalz. & Gibs. Bomb. Fl.* 187. *S. rugosus*, *Wight Ic. t.* 1619. *S. lupulinus*, *T. Anders. in Journ. Linn. Soc.* ix. 469, *partly*. *Ruellia bracteata*, *Heyne in Herb. Rottler*; *Wall. Cat.* 2357, *type sheet only*, *not Goldfussia bracteata*, *Nees.*

W. DECCAN PENINSULA from the Bombay Ghats to the Bababooduns and Nilgherries; *Heyne, Wight, Dalzell, &c.*

*Stems* never exceeding 18 in. high (*Dalzell, Stocks*), hirsute upwards. *Leaves* 6 by  $2\frac{3}{4}$  in., closely serrate, tubercular-hairy above, softly hairy beneath, drying green



(not black); nerves 7 pair; petiole 2 in. *Peduncles* short or 0; spikes 1–1½ in.; bracts  $\frac{2}{3}$  in., ventricose, membranous. *Calyx*  $\frac{1}{3}$  in., divided nearly to the base; segments ligulate, subobtusely, membranous, lineolate. *Corolla* glabrous without, hairy within, pale blue; contracted portion scarcely shorter than the ventricose; limb equal, segments round. *Filaments* and *style* hairy. *Capsule* scarcely  $\frac{1}{3}$  in., oblong, 4-seeded. *Seeds*  $\frac{1}{10}$  in., ovoid, glabrous except on the very margin.

VAR. ? *campanulata*; leaves ovate subacute hairy, spikes subglobose solitary or few together, bracts elliptic ventricose glabrous, bracteoles 0, corolla scarcely  $\frac{1}{2}$  in. *S. campanulata*, *Wight Ic.* t. 1562. *S. involucratum* Var.  $\beta$ , *Nees in DC. Prodr.* xi. 184. *S. lupulinus*, *T. Anders. in Journ. Linn. Soc.* ix. 469, partly. *Ruellia lupulina*, *Wall. Cat.* 2355 b, partly.—Coorg; *Wight*.—Plant 5–10 in. *Leaves* 1–2 in., drying green. *Heads*  $\frac{1}{2}$ –1 in. *Corolla* subcampanulate; lobes very short. *Capsule* less than  $\frac{1}{3}$  in., seeds glabrous. Possibly an alpine var. of *S. Heyneanus*, but the corolla is a different shape, as well shown in *Wight's* figure. The example of *Wall. Cat.* 2355 b in his own *Herb.* is nearer *S. Heyneanus*, *Nees*, type; that in *Herb. Hook.* agrees closely with *Wight's campanulatus*.

VAR. ? *fusca*; leaves broadly elliptic acuminate at both ends very sparsely hairy, heads globose nodding mostly solitary, bracts broadly elliptic ventricose glabrous, bracteoles 0. *S. lupulinus*, *Benth. in Pl. Hohenack.* n. 814; *T. Anders. in Journ. Linn. Soc.* ix. 469 partly, not of *Nees*.—Mercara in Canara, *Hohenacker*. *Branches* 15 in., nearly glabrous. *Leaves* 5 by 2½ in., somewhat black in drying, densely lineolate on both surfaces, very minutely sparsely hairy. *Heads* 1–1½ by  $\frac{3}{4}$ –1 in.; bracts and calyx as of *S. Heyneanus*. *Corolla* not known.

VAR. *viridis*; stem stout rough, leaves 1–3 in. very scabrous, heads small bracts (at flower-time) closely adpressed. *S. asperimus*, *Dalz. & Gibs. Bomb. Fl.* 187, not of *Nees*.—*Strobilanthes* sp. n. 32, *Herb. Ind. Or. H. f. & T.*—Mysore; *G. Thomson*.—The specimens do not match those of *S. lupulinus*, but *Col. Beddome* after seeing them says it is that species.

43. ***S. ixiocephalus***, *Benth. in Flora* 1849, p. 557; leaves lanceolate or elliptic acuminate slightly hairy, heads ovoid closely cymed, bracts elliptic acuminate to an obtuse apex viscous hairy. *Bedd. Ic. Pl. Ind. Or.* t. 203. *S. Neesianus*, *Wight Ic.* t. 1523; *Dalz. & Gibs. Bomb. Fl.* 188. *S. eriocephalus*, *T. Anders. in Journ. Linn. Soc.* ix. 466.—*Strobilanthes* sp. n. 64, *Herb. Ind. Or. H. f. & T.* *S. glutinosus*, *Grah. Cat. Pl. Bomb.* 162 ?.

W. DECCAN PENINSULA and S. MADRAS, alt. 1–3000 ft., frequent; *Wight*, *Hohenacker*, &c.

A small shrub. *Leaves* 5 by 2 in., or oftener smaller narrower, base cuneate (sometimes very shortly), crenate, mature nearly glabrous, conspicuously lineolate above; nerves 7 pair; petiole  $\frac{3}{4}$  in. *Heads*  $\frac{1}{2}$ –1½ in., bracts and calyx enlarged in fruit, usually very glutinous, sometimes softly hairy; bract  $\frac{2}{3}$  by  $\frac{1}{3}$  in.; bracteoles  $\frac{1}{3}$  in., linear-spathulate. *Calyx*  $\frac{1}{4}$ – $\frac{1}{2}$  in., divided nearly to the base; segments ligulate, fruiting spathulate, obtuse, membranous. *Corolla*  $\frac{3}{4}$ –1 in., glabrate without, hairy within, subsymmetric, white; cylindric portion nearly as long as the ventricose. *Filaments* hairy towards the base. *Pistil* glabrous. *Capsule*  $\frac{1}{2}$  in., often 2-seeded. *Seeds*  $\frac{1}{6}$  in., thin, ovate, densely elastically hairy on all sides; areoles very small.

44. ***S. micranthus***, *Wight Ic.* t. 1519; leaves ovate acuminate sparsely thinly pubescent, heads solitary ovoid nodding, bracts broadly lanceolate pubescent, bracteoles longer corolla shorter than the calyx. *T. Anders. in Journ. Linn. Soc.* ix. 468.

NILGHERY MTS.; *Wight*.

Suffrutescent or herbaceous (*Wight*), erect; stems glabrous. *Leaves* 6 by 3½ in., base broad, shortly decurrent, closely serrate; nerves 11 pair; petiole 1½ in. *Heads* 1½–2½ in.; bracts 1 in., widest close to the base, thinly herbaceous; bracteoles  $\frac{3}{4}$  in., linear-lanceolate. *Calyx*  $\frac{1}{2}$ – $\frac{2}{3}$  in., divided nearly to the base; segments linear-lanceolate, very acute, pubescent. *Corolla*  $\frac{1}{2}$  in., subcampanulate, dry appearing dull red; lobes very short, round. *Filaments* glabrous; anthers exserted. *Pistil* glabrous.



*Capsule* unknown.—This imperfectly known species may very possibly have its true position nearer to *S. Heyneanus* var. *campanulata*.

45. ***S. scrobiculatus***, *Dalz. ms.*; leaves elliptic acuminate at both ends nearly glabrous, spikes numerous subsessile along the naked branches, corolla 1 in. blue.

BOMBAY GHATS; *Dalzell*; Mahabeleshwur, *Ralph*.

Woody branches elongate, much divided, leafless, covered with flowers, tips leafy. *Leaves* 3 by 1 in., nearly entire; nerves 7 pair; petiole  $\frac{1}{2}$  in. *Spikes* 1 in., subsessile, viscous hairy; bracts  $\frac{1}{4}$  in., narrowly obovate, persistent in fruit; bracteoles  $\frac{1}{3}$  in., sublinear. *Calyx*  $\frac{1}{2}$  in., divided nearly to the base; segments linear, hairy. *Corolla* symmetric, nearly glabrous, pale below, a beautiful blue upwards; ventricose part rather narrow longer than the contracted; lobes ovate, crenulate. *Stamens* included, glabrous. *Style* with a few hairs. *Capsule*  $\frac{1}{3}$  in., 4-seeded. *Seeds*  $\frac{1}{10}$  in., thin, ovate, densely covered with fine long hairs, elastic when wet, except the small areoles.—Appears to be the most beautiful species of the genus; it is allied to *S. ixiocephalus*.

46. ***S. papillosus***, *T. Anders. in Journ. Linn. Soc.* ix. 468; scabrous hispid, leaves ovate acute, heads ellipsoid, bracts elliptic elongate scabrous hispid, corolla  $1\frac{1}{2}$ – $1\frac{3}{4}$  in. *Bedd. Ic. Pl. Ind. Or.* t. 201. *S. scaber*, Var. ?  $\beta$ , *Benth. in Pl. Hohenack.* n. 1431.

NILGHERRY MTS.; alt. 7000 ft., *Hohenacker, Beddome.* MYSORE; *Lobb*.

A large shrub (*Beddome*); branches very harshly scabrous. *Leaves*  $2\frac{3}{4}$  by  $1\frac{3}{4}$  in., obtuse, base very shortly cuneate, callous-dentate, hispid with tubercle-based hairs above, setulose beneath; nerves 6 pair; petiole  $\frac{3}{4}$  in. *Heads*  $1\frac{1}{2}$ –2 in., strictly capitate; peduncles thickened upwards, acutely 4-angled, very harshly scabrous; floral leaves 2 in., empty, overtopping the head; bract very rigid; bracteoles 1 in., narrowly lanceolate, membranous, ciliate. *Calyx* divided nearly to the base; segments  $1\frac{1}{4}$  in., linear-lanceolate, very acute, membranous, ash-coloured, ciliate. *Corolla* subsymmetric, nearly glabrous, blueish; cylindric part hardly so long as the ventricose; lobes ovate. *Stamens* glabrous, included. *Pistil* thinly hairy. *Capsule* unknown.—Allied to *S. Perrottetianus* according to *Beddome*, and it may turn out so to be when the seeds are known.

47. ***S. exsertus***, *Clarke*; leaves petioled ovate acute at both ends scabrid-pubescent, spikes densely capitate solitary terminal, bracts obovate as long as the calyx, corolla  $\frac{3}{4}$  in., anthers exsert. *Stenosiphonium zeylanicum*, Var.  $\alpha$ , *T. Anders. in Thwaites Enum.* 225, and in *Journ. Linn. Soc.* ix. 463.

CEYLON; *Thwaites* (C. P. 3577); Damboul, *Beckett*.

A shrub, 1–2 ft., creeping, rooting; branches suberect, quadrangular, pubescent. *Leaves*  $1\frac{3}{4}$  by  $\frac{3}{4}$  in., crenate, rather harsh, lineolate on both surfaces, sparsely setose above, more softly beneath; nerves 5–6 pair; petiole  $\frac{1}{2}$  in. *Heads* sessile setose above, more softly beneath; nerves 5–6 pair; petiole  $\frac{1}{2}$  in. *Heads* sessile between 2 somewhat enveloping leaves; quasi-peduncles 0– $1\frac{1}{2}$  in., often thickened upwards; bracts  $\frac{1}{3}$  in., subobtuse, green, persistent, patently white-hairy. *Calyx*  $\frac{1}{3}$  in., divided about half-way down at flower-time, teeth lanceolate, hairy. *Corolla* curved, nearly glabrous without; cylindric base  $\frac{1}{3}$  in., funnel-shaped part nearly as long; lobes ovate. *Filaments* glabrous except at the base, 2 longer distinctly exserted; anthers all subequal. *Ovary* glabrous, tip glandular, 4-ovulate; style glabrous, stigma simple. *Capsule*  $\frac{1}{2}$  in., oblong, glabrous, 4-seeded from near the base. *Seeds*  $\frac{1}{8}$  in. diam., much compressed, orbicular, densely elastically hairy, except on the conspicuous areoles.—Placed in *Stenosiphonium* by *T. Anderson*, and regarded as a var. of *Hemigraphis venosa*. The inflorescence does not do for *Stenosiphonium*, nor the leaves, and the ovules are never more than 4 to the ovary.

VAR.  $\beta$  *integra*, *T. Anders. l. c.*; leaves entire glabrous, corolla 1 in. ventricose, constricted cylindric base of the tube short.—Ceylon; *Thwaites* (C. P. n. 3661).



The only scrap of this does not permit of dissection; it can hardly be conspecific with *S. exsertus*, but may not be congeneric; it closely resembles *S. lanceolatus*.

48. **S. Gardnerianus**, *T. Anders. in Thwaites Enum.* 226; hairy, leaves sessile ovate, spikes ovoid or interrupted at base, bracts and bracteoles longer than the calyx, corolla 1 in. purple, anthers included. *Endopogon Gardnerianus*, *Nees in DC. Prodr.* xi. 723.

CEYLON; *Gardner, Thwaites*.

Shrubby, 1–2 ft.; stems terete, scabrous below, white-hirsute upwards. *Leaves* 2 by  $1\frac{1}{4}$  in., acute or subobtusate, base rounded, subcrenate. *Spikes* capitate,  $\frac{3}{4}$  in., nearly enclosed by bracts, few-fl., or lower axillary flowers being added becoming interrupted, linear-oblong; bracts  $\frac{2}{3}$  in., ovate; bracteoles  $\frac{1}{2}$  in., linear-oblong. *Calyx*  $\frac{1}{3}$  in., slightly hairy. *Corolla-tube* linear-cylindric below, suddenly inflated upwards, as of *Stenosiphonium*. *Capsule* and *seeds* unknown: hence the place of this species is uncertain; some of the examples might, so far as the inflorescence is concerned, be placed next *S. sexennis* among the Series D. “*Paniculatæ*.”

¶¶ *Species of N. India and the Malay Peninsula.*

49. **S. scaber**, *Nees in Wall. Pl. As. Rar.* iii. 84, and in *DC. Prodr.* xi. 177, *partly*; leaves elliptic or obovate acuminate scabrous or ultimately glabrate, spikes dense often clustered, bracts lanceolate large hairy, corolla  $\frac{3}{4}$ –1 in. yellow very hairy within. *Bot. Reg.* xxvii. t. 32; *T. Anders. in Thwaites Enum.* 227, and in *Journ. Linn. Soc.* ix. 467, *partly*. *Ruellia scabra*, *Wall. Cat.* 2393, *not Wall. Cat.* 2377. *R. aspera*, *Nees in DC. Prodr.* xi. 147, *as to the Bengal material*. *R. crispa*, *Herb. Linn. Propr.*

N. and E. BENGAL PLAINS; Silhet, *Wallich*; Purneah, *J. D. H.*; Maldah, Mymensingho, Dacca, &c., *Clarke*.—DISTRIB. Burma.

*Stems* 1–3 ft., pubescent or hairy upwards. *Leaves*  $4\frac{1}{2}$  by 2 in., base narrowed, crenate, sometimes very coarsely scabrous-subhispid, sometimes nearly smooth but hard; nerves 7–8 pair; petiole  $\frac{3}{4}$  in. *Spikes* 1–2 in., hairy; bracts 1 by  $\frac{1}{2}$  in., obtusely acuminate, green; bracteoles  $\frac{1}{4}$  in., linear-oblong. *Calyx*  $\frac{1}{4}$ – $\frac{1}{3}$  in., divided nearly to the base; segments linear, pubescent. *Corolla* symmetric, glabrous; cylindric base nearly as long as the ventricose portion; lobes rounded. *Stamens* included; filaments hairy towards the base. *Ovary* glandular at the apex, always 4-ovulate; style nearly glabrous. *Capsule* nearly  $\frac{1}{2}$  in., 4-seeded. *Seeds*  $\frac{1}{12}$  in. diam., discoid; numerous fine hairs near the margin, elastic when wet; areoles very large, glabrous.—This is only *S. scaber*, *Nees*, in so far as that includes *Ruellia scabra*, *Wall.*; *Nees'* description (purple flowers, &c.) is totally different. *S. scaber* only occurs in Ceylon as a cultivated plant, according to *Thwaites* and *Beddome*.

50. **S. phyllostachyus**, *Kurz in Journ. As. Soc.* 1871, pt. ii. 75; leaves elliptic or obovate acuminate scabrous, spikes dense often in close cymes, bracts large elliptic with a ligulate apex softly hairy, corolla  $\frac{3}{4}$ –1 in. yellow somewhat hairy within. *S. crispus*, *T. Anders. in Journ. Linn. Soc.* ix. 467, *not of Blume*.

PEGU; *Kurz*. MOULMEIN; *Parish*. TENASSERIM; *Beddome*.

Herbaceous, 2–3 ft.; stems glabrate. *Leaves* 4–9 in.; petiole 2 in. *Spikes* nearly as of *S. scaber*; bracts 1 in., ligulate tips often recurved; bracteoles  $\frac{1}{3}$ – $\frac{1}{2}$  in., linear. *Calyx*  $\frac{1}{3}$ – $\frac{1}{2}$  in., divided nearly to the base; segments linear silky. *Corolla* nearly as of *S. scaber*. *Capsule*  $\frac{1}{2}$  in., 4-seeded; seeds  $\frac{1}{8}$ – $\frac{1}{6}$  in., thin, ovate, with dense long elastic hairs on all sides except the small areoles.—So like *S. scaber* (except the seeds) that it is difficult to distinguish it.

VAR. *dura*; leaves smaller bracts narrowed upwards without ligulate tip.—*Strobilanthes* sp. n. 14, *Herb. Ind. Or. H. f. & T.*—Chittagong; Seetakoond, *H. f. & T.* Rangoon; *M'Lelland*. *T. Anderson* refers this to *S. scaber* (in *Journ. Linn. Soc.* ix. 467), which the bracts resemble; he subsequently saw it was different, and wrote it up



as *S. durus*, *T. Anders. sp. nov.*; from the imperfectly ripe seeds it is either a var. of *S. phyllostachyus*, or a new species very closely allied to it.

51. ***S. fimbriatus***, *Nees in Wall. Pl. As. Rar.* iii. 85, and in *DC. Prodr.* xi. 180, not of *T. Anders. nor of Kurz*; leaves oblong acuminate at both ends glabrous lineolate on both surfaces, heads ovoid 1–3 together subsessile, bracts obovate-oblong acuminate inciso-serrate rufous hairy. *Ruellia fimbriata*, *Wall. Cat.* 2363.

KHASIA MTS.; *Wallich*.

Shrubby; branches glabrous. *Leaves* 4 by 1 in., denticulate; nerves 8 pair; petiole  $\frac{3}{4}$  in. *Heads*  $\frac{1}{2}$ –1 in., closely capitate, mostly on very short axillary spurs; bracts  $\frac{3}{4}$  in., shortly acuminate, the innermost lanceolate, the outermost often subtruncate; bracteoles  $\frac{1}{2}$  in., linear. *Corolla*  $1\frac{1}{4}$ – $1\frac{1}{2}$  in., glabrous without. *Capsule*  $\frac{3}{4}$ –1 in., oblong, 4-seeded. *Seeds*  $\frac{1}{2}$  in., ovate, shaggy; areoles small.—*Nees*' account of the bracteoles is erroneous; and *T. Anderson* has taken for *fimbriatus* the remote *S. macrostegius*.

52. ***S. pectinatus***, *T. Anders. in Journ. Linn. Soc.* ix. 474; leaves elliptic acuminate at both ends hairy, heads short-peduncled subsolitary ellipsoid, bracts large ovate truncate or pectinate, corolla  $1\frac{1}{2}$ – $2\frac{1}{4}$  in. pale purple. *S. echinatus*, *Nees in Wall. Pl. As. Rar.* iii. 85, and in *DC. Prodr.* xi. 181. *Ruellia pectinata*, *Wall. Cat.* 2356.

SIKKIM and BHOTAN, alt. 6000–7500 ft., frequent; *Griffith, &c.* KHASIA and JAINTIA MTS., alt. 4000 ft., frequent; *Wallich, &c.*

A spreading shrub, often 10 ft. *Leaves* 5 by  $2\frac{1}{4}$  in., serrate, usually thinly hairy, villous or subtomentose beneath; nerves 9 pair; petiole  $\frac{1}{2}$ –1 in. *Heads* 1 in., hairy or hirsute; bracts  $\frac{3}{4}$ –1 in., concave, green; bracteoles  $\frac{3}{4}$  in., linear, widened upwards. *Calyx*  $\frac{2}{3}$ – $\frac{3}{4}$  in., deeply divided; segments linear, glabrous, scarious. *Corolla* wide-funnel-shaped, nearly glabrous. *Filaments* and *pistil* sparsely puberulous. *Capsule*  $\frac{1}{2}$ – $\frac{2}{3}$  in. *Seeds*  $\frac{1}{6}$  in., thin, ovate, mature shaggy with brown, somewhat deciduous, scarcely elastic hairs; areoles small.—From *Nees*' quotation (in *Wall. Pl. As. Rar.*) it is clear that he adopted the name *echinatus* from misreading *Wallich*'s ticket.

VAR. *Daltoni*; brown-villous, leaves tubercular subrugose above, bracts serrulate.—*Darjeeling*; *J. D. H.*—Possibly a distinct species, but the examples are in early bud, and very near *S. pectinatus*.

53. ***S. Simonsii***, *T. Anders. in Journ. Linn. Soc.* ix. 474; leaves broadly lanceolate acuminate softly shortly hairy, heads ellipsoid elongate hairy, bracts elliptic apex produced crenate, bracteoles linear acuminate at both ends softly hairy. *Kurz For. Fl.* ii. 244.

ASSAM; Dewangiri Hills, *Simons*; Namroop in the Patkoye Mts., *Griffith* (*Herb. Propr.* n. 249). MARTABAN and TENASSERIM, in the tropical forests, *Kurz*.

A shrub; branches pubescent or viscous-hairy. *Leaves*  $5\frac{1}{2}$  by 2 in., base cuneate, crenate, minutely lineolate above, more hairy (especially on the 7–8 pair of nerves); petiole  $\frac{1}{4}$  in. *Heads*  $1\frac{1}{4}$  by  $\frac{1}{3}$  in., on very short quasi-peduncles, often 2–3 together; outer pair of bracts (of *T. Anderson*) leaf-like, sometimes like the true bracts; bract  $1\frac{1}{4}$  in., softly shortly hairy; bracteoles 2,  $\frac{2}{3}$  in., more acuminate than in the allied species. *Sepals* nearly as the bracteoles. *Corolla* 2 in. (*Anderson*), glabrous. *Capsule* glabrous, 4-seeded (*Anderson*).—*Anderson* apparently had better material than exist now at Kew; he says “buds yellow fide *Griffith*,” but it is more probable that the flowers are purplish: he certainly erred in reading “Kamroop” in Lower Assam (for Namroop).—It is not probable that a Patkoye Mt. plant should be common in the tropical Tenasserim forests: no example has been seen thence, but *Kurz*'s description coincides with the Patkoye plant. He describes the flowers as blue.

54. ***S. glabratus***, *Nees in Wall. Pl. As. Rar.* iii. 85, and in *DC.*



*Prodr.* xi. 183; leaves elliptic acuminate at both ends mature glabrate, heads ovoid peduncled pubescent or glabrate, bracts ovate or elliptic narrowed upwards concave entire. *T. Anders. in Journ. Linn. Soc.* ix. 474. *Ruellia?* glabrata, *Wall. Cat.* 2390.—*Acanthaceæ*, *Griff. Ic. Pl. As.* t. 425.

KHASIA and JAINTEA MTS., alt. 3–4000 ft.; *Wallich, Griffith, &c.*

A shrub, 3–4 ft., erect; branches pubescent, glabrate or with spreading fulvous hairs. *Leaves* 5 by  $1\frac{3}{4}$  in., undulate, crenulate or nearly entire, raphides very obscure on either surface; nerves 7–9 pair; petiole scarcely  $\frac{1}{3}$  in. *Peduncles* 1–3 in., often subcymose, quadrangular, slightly thickened upwards, fulvous pubescent or glabrate; heads  $1\frac{1}{4}$  in., dense; bracts  $1\frac{1}{4}$  in., coriaceous in fruit; bracteoles  $\frac{3}{4}$  in., sublinear, scarious. *Sepals* resembling the bracteoles. *Corolla* 1 in., subsymmetric, glabrous (blue, *Nees*). *Capsule*  $\frac{3}{4}$  in., broadly oblong, glabrous, 4-seeded. *Seeds*  $\frac{1}{3}$  in., ovate, shaggy with silky, dusky, subinelastic hair, except on the small areoles.—*Wallich's* examples are subglabrous, but others are very pubescent.—In *Griff. Notul.* iv. 145, the plate cited t. 425 is named *Phlogacanthus curviflorus*: there is some great blunder here, and the description is puzzling.

55. **S. Maingayi**, *Clarke*; leaves lanceolate acuminate at both ends somewhat pubescent, heads subsessile ovoid nearly glabrous, bracts ovate or elliptic large concave often crenate upwards glabrous.

MALAYA, probably Malacca or Penang; *Maingay* (*Kew Distrib.* n. 1182).

A shrub, apparently allied to *S. pectinatus*, & *glabratus*; branches pubescent. *Leaves* 4 by 1 in., serrulate, puberous and interspersed with most minute raphides; nerves 8 pair, brown-pubescent beneath at least when young; petiole scarcely  $\frac{1}{4}$  in. *Peduncles*  $0-\frac{1}{6}$  in., rusty-pubescent; heads 1 in.; bracts  $\frac{3}{4}$ –1 in., outermost barren ovate, inner elliptic, usually with a few coarse crenations near the apex; bracteoles  $\frac{1}{4}$ – $\frac{1}{3}$  in., linear, glabrous. *Sepals* rather larger than, similar to, the bracts. *Corolla*  $1\frac{1}{4}$  in. at least, glabrous.—No capsule nor expanded flowers seen. There are specimens (unnamed) from Sumatra which may be conspecific with this, but they have hairy heads.

56. **S. glomeratus**, *T. Anders. in Journ. Linn. Soc.* ix. 475; leaves ovate acute serrate hairy, heads ovoid subsessile hairy, bracts elliptic elongate or oblong entire or toothed, corolla  $1\frac{1}{4}$ – $2\frac{1}{4}$  in. purplish glabrous. *Ruellia glomerata*, *Wall. Cat.* 2361. *Goldfussia glomerata*, *Nees in Wall. Pl. As. Rar.* iii. 88, and in *DC. Prodr.* xi. 173; *Bot. Mag.* t. 3881; *Maund Botanist*, t. 155.

KHASIA MTS., alt. 1000–3500 ft., frequent; *Wallich, &c.* BRITISH BURMA, in the hills, *Brandis, Parish*.

A shrub, 2–6 ft.; branches hairy upwards, often horizontal with complanate foliage. *Leaves*  $4\frac{1}{2}$  by  $2\frac{1}{2}$  in., base narrowed or rounded (often unequal), villous above, less so beneath; nerves 6 pair; petiole  $\frac{1}{4}$ –1 in. *Heads* 1– $1\frac{1}{2}$  in., often pseudo-axillary; bracts 1 by  $\frac{1}{2}$  in., herbaceous, softly hairy, outermost pair usually serrate subfoliaceous, inner entire; bracteoles  $\frac{1}{2}$ – $\frac{2}{3}$  in., linear-lanceolate. *Calyx*  $\frac{1}{2}$ – $\frac{2}{3}$  in., divided nearly to the base; segments linear-oblong, in fruit nervose, membranous, subobtuse. *Corolla* subsymmetric; cylindric nearly as long as the ventricose part. *Filaments* and *pistil* sparsely hairy. *Capsule*  $\frac{3}{4}$  in., broadly oblong, 4-seeded. *Seeds*  $\frac{1}{6}$  in., densely silkily subinelastically hairy; areoles very small.—*T. Anderson* has placed this in his *Goldfussia* section, which has “the spikes naked in flower-time and bracts early deciduous;” but the outermost bracts, including the empty pair (floral leaves), are persistent when the capsule is dehiscent.

57. **S. Brandisii**, *T. Anders. in Journ. Linn. Soc.* ix. 475; leaves elliptic acuminate each end thinly hairy, heads obovoid softly densely white-hairy, bracts linear-spathulate, corolla  $1\frac{1}{4}$  in. nearly glabrous.

PEGU; Karen Hills, *Kurz*; Tongoo, alt. 4000 ft., *Brandis* (fide *T. Anderson*).



*Stems* slender, shrubby, pubescent or softly shaggy. *Leaves* 4 by 2 in., crenate, lineolate and sparsely slenderly bristly above, paler more glabrate beneath; nerves 6 pair; petiole  $\frac{3}{4}$  in. *Heads*  $\frac{3}{4}$  in., numerous, on axillary and terminal peduncles; bracts  $\frac{3}{4}$  in., very narrow, outermost pair often more or less leaf-like, persistent; bracteoles  $\frac{1}{4}$  in., linear. *Sepals*  $\frac{1}{4}$  in. and upwards, linear, densely softly white-hairy. *Corolla* nearly straight and symmetric; cylindric part shorter than the ventricose, lobes ovate. *Stamens* glabrous (T. Anders.). *Capsule*  $\frac{1}{3}$  in., oblong, glabrous, with a tuft of hairs at the apex, 4-seeded. *Seeds*  $\frac{1}{2}$  in., ovate, densely subinelastically silky; areoles very small.

58. **S. Falconeri**, T. Anders. in *Journ. Linn. Soc.* ix. 484; leaves ovate or elliptic acuminate hairy, heads small subsessile dense with long soft silvery bristles, bracts ovate hirsute herbaceous, corolla  $\frac{3}{4}$  in. straight slightly hairy without. *S. Karensium*, Kurz in *Journ. As. Soc.* 1873, pt. ii. 94, *ex descr.*

MOULMEIN; *Falconer*. TENASSERIM; *Beddome*.

*Stem* tetragonous, ciliate with long, patent, weak, white hairs. *Leaves* 4 by  $1\frac{1}{2}$  in., narrowed at both ends (upper ovate base obtuse), sparsely white-hairy on both surfaces, not lineolate; nerves 6 pair; petiole  $\frac{2}{3}$  in. *Heads*  $2\frac{1}{2}$  in., surrounded by leaves; bracteoles  $\frac{1}{2}$  in., linear. *Calyx* deeply 5-partite; segments shorter than the bracteoles, linear, hirsute. *Corolla*  $1\frac{1}{4}$  in., curved near the mouth, a little hairy without, deep blue; stamens included. *Capsule* tomentose at the apex. *Seeds* large, ovate, hirsute.—The species seems allied to *S. Brandisii*, but is remarkable by the copious long soft white bristles upon the flower-heads, which extend in less numbers to the leaves and stem.

\*\* *Flowers strobilate.*

† *Seeds glabrous.* (Species of Ceylon and S. Deccan Peninsula.)

59. **S. vestitus**, Nees in *DC. Prodr.* xi. 180; hirsute, leaves rhomboid-elliptic acuminate, bracts ovate acuminate hirsute. T. Anders. in *Journ. Linn. Soc.* ix. 466; *Bedd. Ic. Pl. Ind. Or.* t. 260.

CEYLON, alt. 5–7000 ft.; *Walker, Thwaites*.

Herbaceous (fide *Beddome*); branches stout. *Leaves*  $5\frac{1}{2}$  by  $2\frac{3}{4}$  in., narrowed downwards, cuneate or shortly rounded on the petiole, serrulate, hirsute on both surfaces; nerves 7 pair; petiole  $1\frac{1}{2}$  in. *Spikes* 1– $3\frac{1}{2}$  in.; bracts  $\frac{2}{3}$  in., somewhat squarrose; bracteoles  $\frac{1}{3}$  in., oblong. *Calyx*  $\frac{1}{2}$  in. (in fruit  $\frac{2}{3}$  in.), divided nearly to the base; segments lanceolate, shaggy with white or tawny hairs. *Corolla*  $1\frac{1}{4}$  in., subsymmetric, glabrous; cylindric base short, broad. *Filaments* and *pistil* glabrous. *Capsule*  $\frac{1}{2}$ – $\frac{2}{3}$  in., 4-seeded. *Seeds*  $\frac{1}{4}$  in., thin, ovate, apiculate, glabrous; areoles very small, oblong.

60. **S. Hookeri**, Nees in *DC. Prodr.* xi. 185, *excl. Var. β*; leaves broadly lanceolate, base cuneate sparsely hairy or glabrate, bracts orbicular or ovate glabrous or slightly ciliate. T. Anders. in *Thwaites Enum.* 227, and in *Journ. Linn. Soc.* ix. 469; *Bedd. Ic. Pl. Ind.* t. 262.

CEYLON, alt. 7000 ft.; *Gardner, Thwaites, &c.*

A shrub, 5–6 ft., branches nearly glabrous. *Leaves*  $5\frac{1}{2}$  by 2 in., acuminate, serrulate, upper surface with scattered weak hairs above or mature glabrous; nerves 8 pair; petiole 1 in. *Spikes* 1–3 in.; bracts 1 in., entire or minutely toothed, obtuse or subacute, white; bracteoles  $\frac{1}{2}$  in., spathulate-oblong. *Calyx*  $\frac{2}{3}$  in., divided nearly to the base; segments lanceolate, often setulose, white. *Corolla*  $1\frac{1}{4}$  in., campanulate, subsymmetric, glabrous, white with purple streaks; cylindric base broad, very short. *Stamens* and *pistil* glabrous. *Capsule*  $\frac{1}{2}$  in., frequently 2-seeded. *Seeds*  $\frac{1}{4}$  in., very thin, ovate, apiculate, glabrous; areoles very small, oblong.—The colours are from a field-note of Col. Walker. This is placed by T. Anderson in a section



far removed from *S. vestitus*; but it is so nearly allied that the specimens have been sometimes confounded by the best botanists.

61. ***S. calycinus***, *T. Anders. in Thwaites Enum.* 227, and in *Journ. Linn. Soc.* ix. 469; leaves elliptic acuminate at both ends hairy on both surfaces, bracts spathulate ovate obtuse glabrous or hairy. *Bedd. Ic. Pl. Ind. Or.* t. 209. *S. coloratus*, *Nees in DC. Prodr.* ix. 186, not of *T. Anders.*

CEYLON, alt. 5–7000 ft.; *Gardner, &c.*

A shrub, 4–6 ft., stem glabrous below, more or less hairy upwards. *Bracts* spathulate, often subpetioled, lower passing sometimes into leaves as shown in *Beddome's* figure. *Corolla* varying from green to a lurid reddish yellow. *Seeds* 4 to the capsule, scarcely  $\frac{1}{2}$  in., obovate.—Otherwise as *S. Hookeri*, from which this species (which is *Nees' S. coloratus*) differs at sight by being a little more hairy. The *S. calycinus* var.  $\beta$  of *Nees* is founded on a sheet of 3 fragments, whereof 2 are *S. calycinus* *T. Anders.*, 1 is *S. Hookeri*.

VAR. ? *parvifolia*; leaves  $\frac{1}{2}$ – $\frac{3}{4}$  in. long, heads small 2–5-fld., corolla scarcely  $\frac{3}{4}$  in., anthers subexserted. *S. calycinus*, *Nees in DC. Prodr.* ix. 469.—Ceylon; *Walker*.

62. ***S. laxus***, *T. Anders. in Thwaites Enum.* 228, and in *Journ. Linn. Soc.* ix. 469; leaves cordate ovate acuminate minutely scabrous-hairy or glabrate, bracts ovate or orbicular subentire glabrous or ciliate. *Bedd. Ic. Pl. Ind. Or.* t. 223.

CEYLON; Hantani, alt. 4000 ft., *Thwaites*.

A shrub, 4–6 ft.; branches glabrate. *Leaves* 6 by  $3\frac{1}{2}$  in., crenate or toothed; nerves 6 pair; petiole 2 in. *Spikes* 2–5 in., often in dense sessile clusters on the old wood; bracts  $\frac{1}{2}$ –1 in.; bracteoles  $\frac{1}{3}$  in., linear-oblong. *Sepals*  $\frac{1}{2}$  in. (or more in fruit), lanceolate or broadly lanceolate, ciliate. *Corolla*  $\frac{3}{4}$ –1 in., glabrous except hairy lines within, orange-red; ventricose portion short, about as long as the contracted portion; lobes ovate, elongate, subacute, as described by *T. Anderson*, not well shown in *Beddome's* figure. *Stamens* and *pistil* glabrous. *Capsule*  $\frac{1}{3}$  in., narrowly ellipsoid, 4-seeded. *Seeds*  $\frac{1}{6}$ – $\frac{1}{5}$  in., thin, obovate or subquadrate, glabrous; areoles obsolete.—Easily distinguished from the allied Ceylon species by the broad decisively-cordate base of the leaves.

63. ***S. Andersonii***, *Bedd. in Trans. Linn. Soc.* xxv. 222, and *Ic. Pl. Ind. Or.* t. 208; leaves rhomboid-elliptic or ovate acuminate loosely villous on both surfaces, bracts elliptic obtuse glabrous ciliate. *T. Anders. in Journ. Linn. Soc.* ix. 469.

S. DECCAN; Anamallay Mts., alt. 6000 ft., *Beddome*.

A very large shrub up to 20 ft. (*Beddome*); branches hairy upwards. *Leaves* 7 by 4 in., rhomboid, base rounded or subcordate, crenulate; nerves 7 pair; petiole  $1\frac{1}{2}$  in. *Spikes* 1– $2\frac{1}{2}$  in., axillary, nodding; bracts  $\frac{3}{4}$  in.; bracteoles  $\frac{2}{3}$  in., linear-oblong. *Sepals*  $\frac{2}{3}$ – $\frac{3}{4}$  in., linear-oblong, ciliate. *Corolla*  $1\frac{1}{4}$  in., subcampanulate, contracted base very short, subsymmetric, glabrous except hairy lines within, pale-blueish. *Stamens* and *pistil* glabrous. *Capsule* not seen; but the species is doubtless closely allied to *S. calycinus*, as *Beddome* says, and the leaves still more resemble *S. vestitus*.

64. ***S. luridus***, *Wight Ic.* t. 1515–6; leaves ovate acuminate closely softly hairy on both surfaces, bracts large orbicular entire glabrous. *T. Anders. in Journ. Linn. Soc.* ix. 469.

NILGHERRY MTS., alt. 3–5000 ft.; *Gardner, Wight, &c.* ANAMALLAY MTS. (fide *Beddome's* list).

Gregarious shrubs, 10–18 ft. high, often forming entire coppices, flowering every



spring from the old wood, often from near the ground. *Leaves* 6 by 3 in., tapering at the base, crenulate; nerves 9 pair; petiole  $1\frac{1}{2}$  in. *Spikes* 3–11 in., often clustered, pendulous; bracts  $\frac{3}{4}$  in., blackish-purple; bracteoles  $\frac{3}{4}$  in., ligulate, minutely scabrous. *Calyx*  $\frac{3}{4}$  in., divided nearly to the base; segments lanceolate, minutely scabrous. *Corolla* 1– $1\frac{1}{2}$  in., glabrous except lines within, lurid purple, somewhat 2-lipped; ventricose portion short, longer than the contracted portion; lobes ovate. *Stamens* and *pistil* glabrous. *Capsule*  $\frac{3}{4}$  in., usually 4-seeded. *Seeds*  $\frac{1}{2}$  in., thin, obovate, obtuse, glabrous; areoles obsolete.

65. **S. bolamputtensis**, *Bedd. Ic. Pl. Ind. Or.* t. 200; leaves ovate acuminate glabrous except few scattered minute bristles, bracts large orbicular serrate softly hairy afterwards glabrate.

S. DECCAN; Bolamputty Hills near Coimbatore, alt. 6000 ft., *Beddome*.

A shrub, 15 ft., flowering every year from the old wood; habit of *S. luridus*. *Leaves* 6 by 3 in., base attenuate, crenulate or toothed, lineolate, white-bristly sparsely on the surface above and on the 6–7 pair of nerves beneath; petiole  $1\frac{1}{2}$  in. *Spikes* 2–4 in., very broad, from the old wood and also terminal; bracts  $\frac{3}{4}$ – $1\frac{1}{4}$  in. wide, obtuse; bracteoles  $\frac{1}{2}$  in., narrowly oblong. *Sepals*  $\frac{3}{4}$  in. (at least in fruit), broadly lanceolate, ciliate, somewhat white-bristly. *Corolla* 1 in., subcampanulate, glabrous, brown (*Beddome*); lobes short in *Beddome's* picture, appear longer more as of *S. luridus* in his example. *Stamens* and *pistil* glabrous. *Capsule*  $\frac{3}{4}$  in., broadly oblong, 4-seeded. *Seeds*  $\frac{1}{4}$  in., thin, subquadrate, glabrous; areoles obsolete.

†† *Seeds hairy* (where known).

66. **S. callosus**, *Nees in Wall. Pl. As. Rar.* iii. 85 chiefly, and in *DC. Prodr.* xi. 185 chiefly; leaves elliptic acuminate at both ends sparsely hairy above glabrate beneath, bracts ovate or elliptic concave obtuse glabrous, bracteoles 0, capsule 2-seeded. *Dalz. & Gibs. Bomb. Fl.* 188; *T. Anders. in Journ. Linn. Soc.* ix. 469. *S. Grahamianus*, *Wight Ic.* t. 1520; *Dalz. & Gibs. Bomb. Fl.* 187; *T. Anders. in Journ. Linn. Soc.* ix. 469. *Ruellia callosa*, *Wall. Cat.* 2359.—*Strobilanthes* sp. n. 69, *Herb. Ind. Or. H. f. & T.*

BOMBAY GHATS and CENTRAL INDIA; *Graham, Dalzell, &c.*

A shrub, 6 ft.; branches glabrate, often warted or scabrous-tubercled. *Leaves* 7 by 3 in., sometimes much larger, crenate, conspicuously lineolate above; nerves 8–16 pair; petiole 2 in. *Spikes* 1–4 in., often densely or laxly cymose; bracts  $\frac{1}{2}$ –1 in., orbicular or elliptic. *Calyx*  $\frac{1}{2}$  in., in fruit often exceeding  $\frac{3}{4}$  in., lobed nearly to the base, segments oblong, obtuse, softly hairy. *Corolla*  $1\frac{1}{2}$  in., subsymmetric, glabrous without, very hairy within, deep-blue (*Dalzell*); cylindric base as long as the ventricose portion. *Filaments* hairy downwards. *Pistil* glabrous. *Capsule*  $\frac{3}{4}$  by  $\frac{1}{3}$  in. *Seeds* more than  $\frac{1}{3}$  in. long, thin, obovate acute, densely shaggy with white adpressed inelastic hairs, except on the large oblong areoles.—As *Dalzell* says his *S. callosus* had the seeds “quite smooth,” it might be supposed that he considered the present plant *S. Grahamianus*, and called *S. Dalzellii*, *T. Anders.* his *S. callosus*; but a reference to his Herbarium and notes shows this was not so. He distinguished *S. Dalzellii* as a species, but proposes no name for it; while he (most erroneously) notes on his own excellent fruiting specimen of *S. callosus* that it differs from *S. Grahamianus* in having the seeds glabrous.

*VAR. hispida*; bracts copiously white-hispid.—Dasgowa, in the Mahratta country, *Hove*.

67. **S. zeylanicus**, *T. Anders. in Thwaites Enum.* 227, and in *Journ. Linn. Soc.* ix. 470; glabrescent, leaves ovate shortly acuminate at both ends, bracts ovate often with a ligulate apex, bracteoles about as long as the calyx. *Bedd. Ic. Pl. Ind. Or.* t. 224. *S. callosus*, *Nees in Wall. Pl. As. Rar.* iii. 85, and in *DC. Prodr.* xi. 185, the Ceylon material.



CEYLON; *Walker*; alt. 2000 ft., *Thwaites*.

A shrub, 3–5 ft. *Leaves* 7 by  $3\frac{1}{4}$  in., crenate, lineolate on both surfaces; nerves 7 pair; petiole  $1\frac{1}{2}$  in. *Spikes* quasi-peduncled, mostly solitary, sometimes 1 in. ovoid capitate, sometimes  $2\frac{1}{2}$  in., distinctly densely strobiliform; bracts 1 in., entire or denticulate, the ligulate tip often squarrose sometimes closely reflexed in fruit, sometimes obsolete. *Calyx*  $\frac{1}{2}$  in., divided more than half-way down; segments lanceolate, slightly hairy. *Corolla*  $1\frac{1}{4}$  in., narrow, hairy, white (T. Anderson); linear-cylindric base shorter than the long urn-shaped upper part; lobes short. *Filaments* hairy towards the base. *Pistil* glabrous. *Capsule* not seen.—Evidently different from the Bombay *S. callosus*, but may not belong to this part of the series.

68. **S. asper**, *Wight Ic.* t. 1518, *not of Dcne.*; thinly softly hairy, leaves ovate shortly acuminate at both ends, spikes in close panicles or subfasciculate, bracts oblong or ovate, base narrowed. *T. Anders. in Journ. Linn. Soc.* ix. 466.

MTS. of S. INDIA, alt. 5–8000 ft.; Nilgherries, Anamallays, Bababooduns, *Gardner, Wight, &c.* MALABAR GHATS; Concan, *Stocks*.

A shrub, 2–4 ft. *Leaves*  $4\frac{1}{2}$  by  $2\frac{1}{4}$  in., crenate; nerves 7 pair; petiole  $1\frac{1}{2}$  in. *Spikes* in flower 1– $1\frac{1}{2}$  in., oblong; in fruit 2–3 in., with bracts and calyces enlarged; thinly softly hairy, somewhat viscous; bracts  $\frac{1}{4}$ – $\frac{1}{2}$  in., often reddish; bracteoles  $\frac{1}{4}$  in., linear. *Sepals*  $\frac{1}{3}$  in., linear-lanceolate. *Corolla*  $\frac{3}{4}$  in. (or in *Wight's* figure much larger), glabrous without, hairy within; linear-cylindric base about as long as the ventricose portion; limb somewhat oblique, segments short rounded. *Filaments* hairy towards the base. *Pistil* glabrous. *Capsule*  $\frac{1}{3}$  in., oblong, 4-seeded. *Seeds*  $\frac{1}{12}$  in., orbicular, elastically hairy; areoles prominent, round, glabrous.—The form of the bracts seems very variable; the typical Nilgherry plant has them broadly ovate; a Bababoodun example (reckoned by *Wight* distinct) has them linear-oblong; and there are a great number of intermediate forms.

69. **S. sessilis**, *Nees in Wall. Pl. As. Rar.* iii. 85, and in *DC. Prodr.* xi. 177; leaves sessile ovate acute hairy, spikes cylindric exactly strobiliform, bracts large ovate acute hairy, bracteoles 0, corolla  $1\frac{1}{4}$  in. pale purple. *Bot. Mag.* t. 3902; *Wight Ill.* t. 164 b, fig. 4 (right-hand), and *Ic.* t. 1511; *T. Anders. in Journ. Linn. Soc.* ix. 467.

NILGHERRY MTS., alt. 6–8000 ft.; *Wight, &c.*, frequent. WYNAAD and TRAVANCORE; *Beddome*.

*Stems* 12–18 in., numerous, erect, little divided, from a woody perennial root, patently villous. *Leaves*  $\frac{3}{4}$ – $1\frac{1}{2}$  in., base rounded or subcordate, crenate, softly villous on both surfaces. *Spikes* 1–2 in., short-peduncled, quasi-axillary and terminal; bracts  $\frac{3}{4}$  in., softly hairy. *Sepals*  $\frac{1}{2}$  in., lanceolate. *Corolla* nearly straight, subsymmetric, slightly hairy within and without; cylindric base nearly as long as the ventricose part; segments rounded. *Filaments* included; longer shaggy, shorter glabrous with much smaller anthers. *Ovary* glabrous, gland-bearing near the tip; style thinly hairy; ovules 4. *Capsule* not seen.

VAR. *sessiloides* (*Wight Ic.* t. 1512); leaves larger bristle-hirsute rugose, spikes larger, bracts (especially the upper) corolloid glabrate upwards, corolla rather larger more hairy both within and without. *S. sessiloides*, *Wight Ic.* t. 1512, *not of T. Anders.*—Nilgherries; *Wight*.—A very trifling variety (or mere form, *Beddome*) of *S. sessilis*.

VAR. *Ritchiei*; bristly without any soft hairs, leaves nearly glabrous beneath except the bristly nerves, bracts acuminate long-bristly. *S. sessiloides*, *Dalzell & Gibs. Bomb. Fl.* 187; *T. Anders. in Journ. Linn. Soc.* ix. 467, *not of Wight*.—Malabar Ghats; near Bombay, *Dalzell*; Purwhar Ghat, *Ritchie*; Tulkut (perhaps i.e. Talikote), *Stocks*.—Noted by *Ritchie* as flowering only once in 7 years, but the woody root with annual undivided stems seems the same as in *S. sessilis*. *Stems* densely hispid with very long stout white bristles or glabrate. *Leaves* scabrous-hispid lineolate above, much more glabrous than in *S. sessilis*. *Bracts* and *spikes* with white or tawny bristles nearly  $\frac{1}{4}$  in. long, sometimes dense sometimes few scattered.



70. **S. Dupeni**, *Beddome ms.*; leaves subcordate ovate acuminate bristly pubescent on both surfaces, spikes large oblong dense viscous slightly hairy, bracts 4-ranked large ovate obtuse adnate at base closely imbricate, capsule 4-seeded, seeds hairy.

ANAMALLAY MTS.; top of Neliamputty Ghat, *Beddome*.

A shrub. *Leaves*  $4\frac{1}{2}$  by  $2\frac{1}{4}$  in., crenate, bristly above, chiefly on the 9 pair of nerves beneath; raphides small, obscure; petiole 1–2 in. *Spikes*  $2\frac{1}{2}$  by  $\frac{3}{4}$  in., appearing terminal on short axillary peduncles; bracts  $\frac{3}{4}$  by  $\frac{1}{2}$  in., coloured, nervose, very sticky; bracteoles small, lanceolate. *Calyx*  $\frac{1}{2}$  in., deeply 5-lobed; linear green acumination of the segments longer than the short elliptic scarious base. *Corolla* large, blue. *Capsule*  $\frac{1}{3}$  in., ellipsoid, sessile, glabrous. *Seeds*  $\frac{1}{8}$  in. diam.; areolæ nearly half the diam. of the seed.

71. **S. auriculatus**, *Nees in Wall. Pl. As. Rar.* iii. 69, 86, t. 295, and in *DC. Prodr.* xi. 191; leaves sessile auriculate oblong or ovate acuminate hairy, spikes linear oblong closely velvety, bracts obovate obtuse, bracteoles 0. *T. Anders. in Journ. Linn. Soc.* ix. 472; *Bedd. Ic. Pl. Ind. Or.* t. 210. *S. amplexans*, *Nees in Wall. Cat.* 7158, and in *DC. Prodr.* xi. 191. *Ruellia auriculata*, *Wall. Cat.* 2341.

CENTRAL INDIA, alt. 1–4000 ft., common; Behar; Jubbulpore to Chota Nagpore, *J. D. H., Beddome, &c.*—DISTRIB. Ava.

A shrub, 2–6 ft.; branches many divaricate often zigzag, quadrangular, glabrous, tips more or less hairy. *Leaves* often very unequal, sometimes one 10 by  $2\frac{1}{4}$  in. oblong, the other 3 by  $1\frac{1}{2}$  ovate, sometimes subequal, serrulate, sparsely hairy above; nerves (in the longer leaves) 10–13 pair, minutely hairy beneath. *Spikes*  $3\frac{1}{2}$  by  $\frac{1}{2}$  in., mostly terminal, solitary, quasi-peduncled; bracts  $\frac{1}{4}$ – $\frac{1}{3}$  in., broader than long, very obtuse, apex often recurved in fruit. *Calyx* divided nearly to the base; segments  $\frac{1}{4}$ – $\frac{1}{3}$  in., unequal, linear, obtuse, closely velvety. *Corolla* 1 in., curved, very slightly hairy, pale purple; cylindric base much shorter than the ventricose part; limb somewhat 2-lipped. *Stamens* and *pistil* nearly glabrous. *Capsule*  $\frac{1}{3}$  in., glabrous, 4-seeded. *Seeds* scarcely  $\frac{1}{12}$  in., thin, orbicular, elastically white-hairy; areoles very small.

VAR. *Edgeworthiana*; bracts with spreading white cilia  $\frac{1}{4}$  in. long, sepals long white-ciliate at the tips. *S. Edgeworthiana*, *Nees in DC. Prodr.* xi. 190.—Subtropical Himalaya, alt. 500–2000 ft., from the Siwaliks (*Stewart*) to Sikkim (*Gamble*), frequent in the dry Terai. *Parasnath, Edgeworth. Tenasserim*; alt. 2000 ft.; *Beddome*.—Distrib. Upper Burma.

VAR. *plumulosa*; leaves broadly elliptic, spikes short axillary subsessile densely white-ciliate. *S. plumulosus*, *Nees in Wall. Cat.* 7157, and in *Wall. Pl. As. Rar.* iii. 86, and in *DC. Prodr.* xi. 191.—Mts. of Prome; *Wallich*.—*Leaves* 8 by  $3\frac{1}{2}$  in., subequal, spathulate to the widened auriculate base. *Spikes* 1– $1\frac{1}{2}$  in.

VAR. *bracteolata*; leaves sessile auriculate oblong acuminate hairy, spikes linear-oblong ciliate, bracts obovate, bracteoles  $\frac{1}{4}$  in. linear-spathulate.—Khasia Mts., alt. 5000 ft.; Nunklow and Myrung, *H. f. & T.*—Branches divaricate, hairy. *Leaves* unequal, the larger  $4\frac{1}{2}$  by  $\frac{3}{4}$ –1 in., serrate. *Spikes* 1– $2\frac{1}{2}$  in., quasi-peduncled, mostly solitary; bracts  $\frac{1}{3}$  in., less obtuse than those of *S. auriculatus*.

72. **S. Maclellandi**, *Clarke*; leaves large elliptic acuminate at both ends sparsely hairy, spikes linear, bracts obovate obtuse white hairy, bracteoles 0.

RANGOON; *M' Lelland*.

Branches stout, quadrangular, zigzag, hairy. *Leaves* 12 by  $4\frac{1}{2}$  in., lower petioled, uppermost subsessile, none auricled; nerves 20 pair. *Spikes* 3 by  $\frac{1}{4}$  in., slender, white, hairy, pendent mostly 3 together from short axillary peduncles.—This has been supposed a form of *S. auriculatus*, but the large many-nerved leaves and slender pendent spikes give it a different aspect: the capsule is rather larger, the seeds nearly the same as in *S. auriculatus*. It would appear distinct enough but for the subjoined variety.



VAR. ? *latipes*; leaves sessile suddenly narrowed subauriculate, bracts narrowly obovate.—Tenasserim; *Beddome*.—Leaves 13 by  $4\frac{1}{2}$  in., primary nerves 20 on each side the midrib.

73. **S. Sabinianus**, *Nees in Wall. Pl. As. Rar.* iii. 86, and in *DC. Prodr.* xi. 190; leaves petioled broadly elliptic shortly acuminate at both ends nearly entire uppermost often sessile cordate, spikes linear pubescent often interrupted towards the base, bracts obovate obtuse, sepals oblong minutely pubescent. *T. Anders. in Journ. Linn. Soc.* ix. 472. *Ruellia Sabiniana*, *Wall. Cat.* 2338; *Bot. Reg.* t. 1238; *Reichb. Exot.* t. 210. *R. argentea*, *Wall. Cat.* 2339.

NEPAL; *Wallich*. KHASIA MTS., alt. 1–4000 ft., frequent; *Wallich*, &c.

A shrub, 2–5 ft.; branches glabrous. Leaves  $6\frac{1}{2}$  by 3 in., undulate, subcrenate, lineolate, minutely setulose above, glabrate or obscurely pubescent beneath; upper leaves often unequal dissimilar, one of each pair smaller sessile cordate. Spikes 2–4 in., quasi-peduncled, mostly solitary; bracts  $\frac{1}{4}$  by  $\frac{1}{3}$  in.; bracteoles  $\frac{1}{4}$  in., oblong. Sepals scarious, minutely glandular-pilose, obscurely oblanceolate not spathulate. Corolla  $1\frac{1}{4}$  in., curved, much ventricose nearly glabrous, lavender-coloured, contracted base short. Filaments glabrous. Capsule scarcely  $\frac{1}{3}$  in., pubescent, 4-seeded. Seeds  $\frac{1}{2}$  in., much compressed, orbicular; when wet the fine white hairs spring out abundantly; areoles nearly half the diam. of the seed, glabrous.—The figures *Bot. Mag.* t. 3517 and *Lodd. Bot. Mag.* t. 1712, adduced for this species by Nees and T. Anderson, show the uppermost leaves petioled much acuminate at the base. Some examples of *S. Sabinianus* have the spike much interrupted, and the species might be placed in the next section. *Wallich* notes, in the Nepal example named *R. argentea*, that the flowers were white.

74. **S. tamburensis**, *Clarke*; leaves ovate shortly acuminate serrate, spikes linear interrupted towards the base ciliate subhirsute, bracts ovate, sepals spathulate ciliate.

E. NEPAL; at the Tambur River, alt. 4–5000 ft., *J. D. H.*

Capsule upwards of  $\frac{1}{3}$  in., 4-seeded. Seeds  $\frac{1}{2}$  in., much compressed, orbicular in outline, covered all over with short inelastic hairs; areoles 0. The general habit and corolla as of *S. Sabinianus*, but the serrate leaves, subhirsute spike, and seeds will not match.

75. **S. nutans**, *T. Anders. in Journ. Linn. Soc.* ix. 475; leaves ovate or broadly elliptic acuminate serrate hairy, spikes ellipsoid or oblong very dense glabrous, bracts large elliptic concave. *Ruellia strobilina*, *Wall. Cat.* 2362. *R. hirta*, *Don Prodr.* 119. *Goldfussia nutans*, *Nees in Wall. Pl. As. Rar.* iii. 88, and in *DC. Prodr.* xi. 174.

NEPAL; *Wallich*.

A shrub, 1–2 ft.; branches hairy. Leaves 3 by  $1\frac{1}{2}$  in., base attenuate or rounded, with scattered hairs on both surfaces, not lineolate; nerves 7 pair; petiole  $\frac{1}{4}$ –1 in. Peduncles  $\frac{1}{2}$ – $1\frac{1}{2}$  in., divaricate or deflexed, hairy; spikes  $1$ – $1\frac{1}{2}$  by  $\frac{2}{3}$  in.; bracts  $\frac{1}{2}$  in., subacute; bracteoles  $\frac{1}{3}$  in., oblong. Calyx  $\frac{1}{4}$ – $\frac{1}{3}$  in., divided nearly to the base, segments linear glabrous. Corolla  $1$ – $1\frac{1}{4}$  in., curved; ventricose part longer than the contracted base. Capsule not seen; and the place of the species is dubious; the spike resembles that of some of the strictly strobiliform Malabar species; *Nees* says the bracts are deciduous, but they cannot be so till long after flower.

76. **S. acrocephalus**, *T. Anders. in Journ. Linn. Soc.* ix. 473; leaves ovate acute crenate hirsute, spikes peduncled solitary linear-cylindric dense hairy, bracts ovate, seeds puberulous subglabrate. *Adenosma affinis*, *Griff. Notul.* iv. 133.

KHASIA MTS., alt. 4–5000 ft., plentiful in the northern half, *Griffith*, *H. f. & T.*, &c.



Shrubby, 1–2 ft., branching; stems hirsute. *Leaves*  $2\frac{1}{2}$  by  $1\frac{1}{2}$  in., base obtuse or rounded, densely minutely lineolate above; nerves 7–8 pair; petiole  $\frac{2}{3}$  in. *Peduncles* 1–4 in., hirsute; bracts  $\frac{1}{3}$ – $\frac{1}{2}$  in., obtuse or scarcely acute, closely strobilate; bracteoles  $\frac{1}{4}$  in., spatulate-oblong. *Calyx*  $\frac{1}{2}$  in., divided  $\frac{2}{3}$  the way down; segments narrowly oblong, obtuse, hairy. *Corolla* 1 in., curved, glabrous without, purplish; cylindric base scarcely so long as the ventricose portion; limb somewhat 2-lipped. *Stamens* glabrous. *Ovary* hirsute at the apex, style sparsely hairy. *Capsule*  $\frac{1}{4}$  in., hairy, 4-seeded. *Seeds*  $\frac{1}{12}$  in., orbicular, distinctly pubescent when young, mature subglabrous, the base of the short hairs only remaining; areoles 0.—A species not very closely allied to any other in the genus.

77. ***S. imbricatus***, *Nees in Wall. Pl. As. Rar.* iii. 86, and *Cat.* 7156, and in *DC. Prodr.* xi. 186; leaves spatulate elliptic acute sparsely hairy on both surfaces, spikes cylindric strobiliform in axillary quasi-panicles, corolla very small, placentæ rising elastically from the bottom of the dehiscing capsule. *T. Anders. in Journ. Linn. Soc.* ix. 473. *S. pterocaulis*, *Kurz in Journ. As. Soc.* 1873, pt. ii. 93.

PEGU and TENASSERIM; *Helper, M'Lelland, Kurz.*—DISTRIB. Ava.

An annual herb fide Kurz, but the examples have all the appearance of the other perennial species; stems stout, sharply quadrangular, hirsute or glabrate. *Leaves* attaining  $12\frac{1}{2}$  by 5 in. (or the upper much smaller 2 by 1 in.), crenate or toothed, lineolate on the upper surface; nerves (in the larger leaves) 15 or more pair; petiole very short owing to the long-decurrent leaf-base. *Spikes*  $1\frac{1}{2}$  in., mostly 5–11 in lax hirsute axillary panicles; leaves at the trichotomous divisions scarcely  $\frac{1}{3}$  in.; bracts  $\frac{1}{3}$  in., obovate-oblong, hirsute towards the apex; bracteoles  $\frac{1}{6}$  in., linear-spathulate. *Sepals*  $\frac{1}{4}$  in., linear, obtuse, hirsute at the tips. *Corolla*  $\frac{1}{3}$  in., subcampanulate, violet ex Nees, yellow ex Kurz. *Capsule*  $\frac{1}{4}$  in., hairy at the tip, 4-seeded. *Seeds*  $\frac{1}{16}$  in., orbicular, hairy; areoles nearly half the diam. of the seed, glabrous.—The spikes in fruit are like those of *Rungia*. Wallich's specimens from Ava have much smaller leaves than the Pegu examples.

78. ***S. longipes***, *Clarke*; leaves elliptic acuminate at each end subentire pubescent or glabrate, spikes oblong hairy or glandular-puberulous, bracts narrowly obovate obtuse or emarginate, calyx nearly equally sub-5-partite segments linear-spathulate obtuse, corolla  $1\frac{3}{4}$  in. *S. acuminatus*, *T. Anders. in Journ. Linn. Soc.* ix. 478, chiefly (not *Adenacanthus acuminatus*, Nees).

TENASSERIM; *Helper* (*Herb. Propr.* n. 304, *Kew Distrib.* n. 6114); Mooleyit, *Beddome*.

*Branches* slender. *Leaves* 6 by  $2\frac{1}{2}$  in., obscurely toothed, raphides conspicuous in the lower paler surfaces, embedded obscure in the upper; nerves 8 pair; petiole  $\frac{1}{4}$  in. *Spikes* 1– $2\frac{1}{2}$  in., clavate-oblong, continuous; bracts  $\frac{1}{4}$ – $\frac{1}{3}$  in., lower deciduous in fruit; bracteoles  $\frac{1}{4}$  in., linear-obovate. *Calyx*  $\frac{1}{3}$  in. and upwards; segments distinctly wider at the tips. *Corolla* nearly straight, puberulous; ventricose portion nearly 1 in., linear portion  $\frac{1}{2}$  in.; lobes rounded, subequal. *Capsule*  $\frac{1}{3}$  in., pubescent at the tip, 4-seeded. *Seeds*  $\frac{1}{10}$  in., ovoid, inelastically shaggy; areoles subobsolete.—Kurz has founded his *S. subflaccidus* on *Helper's* plant (*Kew*, n. 6114), but, as he says the calyx is 2-lipped with the upper lip three-lobed only  $\frac{1}{3}$  the way down, it is clear that his *S. subflaccidus* cannot be this plant; there may have been some error in distribution, or Kurz may have relied on *T. Anderson's* reduction of this n. 6114 under *Adenacanthus*, Nees.

79. ***S. subcapitatus***, *Clarke*; leaves elliptic acuminate subentire glabrous, spikes ellipsoid or subovoid small laxly peduncled, bracts elliptic concave or obovate minutely ciliate-pubescent.

TENASSERIM; *Helper* (*Kew Distrib.* n. 6111).

Shrubby; branches slender, quadrangular, glabrous. *Leaves* 4 by  $1\frac{1}{2}$  in., base



attenuate or obtuse, conspicuously lineolate above, obscurely so beneath; nerves 6 pair; petiole  $\frac{1}{8}$  in. *Peduncles* 2–4 in., slender, quadrangular, glabrous, numerous, axillary, often divided, sometimes bearing reduced caducous leaves; bracts  $\frac{1}{2}$  in., rounded at the tip, densely lineolate; bracteoles  $\frac{1}{6}$  in., linear-obovate, densely lineolate. *Calyx*  $\frac{1}{4}$  in., divided subequally nearly to the base; segments linear-spathulate, minutely ciliate. *Corolla* not seen. *Capsule*  $\frac{1}{2}$  in., pubescent at the tip, 4-seeded. *Seeds*  $\frac{1}{12}$  in., ovate, densely shaggy; areoles small.—Seems very nearly allied to *S. subflaccidus*, Kurz; but the spikes are in general so much shortened that it might be looked for among the capitate series. As in *S. subflaccidus*, the fruiting spikes have the upper bracts, but some of the lower fallen.

\*\*\* *Spikes elongate more or less interrupted, or flowers nearly all distant but mostly opposite.*—(Seeds in all hairy.)

80. **S. Helferi**, *T. Anders. in Journ. Linn. Soc.* ix. 472; leaves ovate acuminate rounded or subcordate at the base nearly glabrous, spikes simple elongate lax subtomentose, flowers distant opposite, bracts broadly obovate obtuse, corolla  $1\frac{1}{4}$ – $1\frac{1}{2}$  in.

TENASSERIM, "Three Pagodas," *Helfer* (Kew Distrib. n. 6117).

*Branches* divaricate, somewhat zigzag, terete, pubescent upwards. *Leaves*  $3\frac{1}{2}$  by  $1\frac{1}{2}$  in., crenate, puberulous and lineolate above, subpubescent on the 7 pair of nerves beneath; petiole 1 in. *Spikes* axillary, short-peduncled, solitary, opposite, 2–5 in.; flowers nearly all paired and distant; bract 1 to each flower,  $\frac{1}{4}$  in., densely minutely fuscous-pubescent, ciliate, apex  $\frac{1}{2}$  in. broad green patent or reflexed; bracteoles 0. *Calyx*  $\frac{1}{2}$  in., equally sub-5-partite; segments linear-ligulate, pubescent, subobtusate. *Corolla* nearly glabrous, straight; cylindric base twice as long as the calyx. *Capsule*  $\frac{1}{4}$  in. *Seeds*  $\frac{1}{12}$  in., orbicular, dusky pubescent; areoles small.—T. Anderson errs in saying "corolla small;" the buds, which appear on the point of expansion, are scarcely  $\frac{1}{2}$  in. long; but there is one fully expanded flower overlooked by T. Anderson, which is (dry) nearly  $1\frac{1}{2}$  in.

81. **S. macrostegius**, *Clarke*; leaves elliptic acuminate subentire nearly glabrous, spikes axillary sessile lax scarcely interrupted, bracts obovate suddenly linear-acuminate, capsule and seeds large. *S. fimbriatus*, *T. Anders. in Journ. Linn. Soc.* ix. 470 partly, not of Nees. *Endopogon macrostegius*, *Nees in DC. Prodr.* xi. 470.

ASSAM and KHASIA MTS.; *Griffith*. CHITTAGONG; Kasalong, *Clarke*.

A straggling, inelegant shrub, 2–5 ft.; branches terete, pubescent upwards or nearly glabrous. *Leaves* 6 by  $2\frac{1}{4}$  in., base cuneate, lineolate above, obscurely so beneath, minutely pubescent on the 9 pair of nerves beneath; petiole  $1\frac{1}{2}$  in. *Spikes* 2–5 in., with 6–8 flowers in opposite pairs; bracts  $\frac{3}{4}$ –1 in., including the linear acumen  $\frac{1}{2}$  in. long, pubescent, or in Griffith's examples subglabrous; bracteoles  $\frac{2}{3}$  in., linear-oblong cuspidate, fulvous-pubescent upwards. *Sepals* in fruit similar to the bracteoles. *Corolla* not seen. *Ovary* glabrous, a dense fulvous tuft of hairs at the apex. *Capsule* 1 in., oblong, 4-seeded. *Seeds*  $\frac{1}{2}$  in., ovate, shaggy; areoles obsolete.—Probably *S. fimbriatus*, Kurz (*For. Fl.* ii. 244), from the forests of the Pegu Yomah and Tenasserim, the bracts of which Kurz says are entire, so that it could not have been Nees' *S. fimbriatus*.

82. **S. polythrix**, *T. Anders. in Journ. Linn. Soc.* ix. 470; leaves elliptic acuminate rufous-ciliate, spikes axillary subsessile continuous very rufous-ciliate, bracts 1– $1\frac{1}{2}$  in. linear-lanceolate.

KHASIA MTS.; *Herb. Kew* and *Herb. Calc.*

A shrub; branches terete, with patent long rufous hairs. *Leaves*  $6\frac{1}{2}$  by  $2\frac{1}{2}$  in., base attenuate or subobtusate, remotely serrate, mature with few scattered long rufous hairs; nerves 9 pair; petiole 1 in. *Spikes* 2–4 in., rufous hairs  $\frac{1}{4}$  in. long, slender, patent; bracteoles  $\frac{3}{4}$  in., linear, green, rufous-ciliate. *Calyx* in fruit nearly 1 in.,



divided nearly to the base; segments linear-lanceolate, scarious below, rufous-ciliate upwards. *Corolla* not seen. *Capsule*  $\frac{3}{4}$  in., linear-oblong, glabrous, tip minutely rufous-hairy, 4-seeded. *Seeds*  $\frac{1}{5}$  in., ovate, silky; areoles hardly any.

83. **S. Brunonianus**, *Nees in Wall. Pl. As. Rar.* iii. 87, and in *DC Prodr.* xi. 188; leaves lanceolate attenuate at both ends nearly glabrous, spikes subpaniculate linear, bracts oblong, sepals linear oblong fulvous hirsute, corolla  $\frac{2}{3}$  in. *T. Anders. in Journ. Linn. Soc.* ix. 472. *S. petiolaris*, *Nees in DC. Prodr.* xi. 189, partly. *Ruellia Brunoniana*, *Wall. Cat.* 2368.

KHASIA MTS., alt. 2–4000 ft., common, *Wallich*, &c.; lower hills of ASSAM, JAINTEA, and NAGAS country.

An erect, dense, annually-flowering shrub, 2–3 ft. *Leaves* 4 by  $\frac{1}{3}$  in. subentire in *Wallich's*, often broader, sometimes 2 by  $\frac{2}{3}$  in. crenate nearly to the base, base always gradually attenuated; nerves 8 pair, often obscure; petiole  $\frac{1}{2}$  in., often narrowly winged. *Spikes* 1–4 in., usually very numerous, dense but often interrupted towards the base, erect; bracts  $\frac{1}{4}$ – $\frac{1}{3}$  in., spatulate-oblong, obtuse, apex recurved or the lowest ovate narrowed upwards, subglabrous in *Wallich's* specimens, often fulvous-hirsute; bracteoles  $\frac{1}{5}$  in., oblong, erect. *Sepals*  $\frac{1}{4}$  in. *Corolla* curved, pubescent without in the bud, lavender or white, cylindric base shorter than the much-ventricose upper part. *Stamens* glabrous, more monadelphous than usual. *Capsule*  $\frac{1}{4}$  in., oblong, pubescent, 4-seeded. *Seeds*  $\frac{1}{10}$  in., orbicular, pubescent; areoles 0.—*S. petiolaris*, *Nees*, is founded on two plants collected by Griffith, one in Khasia, one in Assam, which are both preserved at Kew, authenticated in *Nees's* hand; of these the Khasia one is identically *S. Brunonianus*, *Nees*, the other is taken as *S. petiolaris* below.

84. **S. maculatus**, *Nees in DC. Prodr.* xi. 190; leaves ovate (upper elliptic) acuminate at both ends nearly glabrous, spikes erect linear sub-interrupted at the base compound hairy, bracts oblong or cuneate-oblong, corolla scarcely  $\frac{3}{4}$  in. ventricose. *Ruellia maculata*, *Wall. Pl. As. Rar.* iii. 33, t. 250.

KHASIA MTS., alt. 1–3000 ft., frequent, *Clarke*.

Shrub, 2–4 ft., lax. *Leaves* 5 by  $2\frac{1}{2}$ – $3\frac{1}{2}$  in. (upper 5 by  $1\frac{1}{2}$ –2 in.), serrate, mature glabrous or obscurely scabrid-puberulous on the nerves beneath, densely lineolate on the upper surface, often beautifully blotched with white when fresh, and as often uniformly green; nerves 10–11 pair; petiole 1– $1\frac{1}{2}$  in. *Spikes* 1–3 in., forming lateral and terminal cymes or panicles, the uppermost leaves being small, caducous; bracts  $\frac{1}{3}$  by  $\frac{1}{16}$  in., linear-oblong (in the most characteristic form), but vary to cuneate-oblong bracteoles  $\frac{1}{5}$  in., linear-oblong. *Calyx*  $\frac{1}{4}$ – $\frac{1}{3}$  in., sub-5-partite; segments linear-oblong, unequal, subobtuse, hairy. *Corolla* slightly curved, nearly glabrous, pale blue or lavender, cylindric base nearly as long as the greatly ventricose upper portion; limb subequal, segments short round reflexed. *Stamens* glabrous, monadelphous, exactly as in *S. Brunonianus*. *Capsule*  $\frac{1}{4}$  in., oblong, pubescent, 4-seeded. *Seeds*  $\frac{1}{20}$ – $\frac{1}{16}$  in. diam., orbicular, shaggy with long hairs; areoles rather small.—This was sent to *Wallich* from Silhet; it is common along the lower Khasia range 20 miles N. of Silhet. *Wallich's* picture, from a cultivated plant, shows the flowers larger than in any of the wild specimens seen; his statement that the species differs essentially from *S. monadelphus* by having the “filaments free at base” is altogether misleading; *Nees* perhaps went entirely on the somewhat coarse picture in *Wall. Pl. As. Rar.*

85. **S. monadelphus**, *Nees in Wall. Cat.* 7159, and in *Wall. Pl. As. Rar.* iii. 87, and in *DC. Prodr.* xi. 188; leaves ovate acuminate at both ends pubescent on the nerves beneath, spikes erect linear panicle very hairy, bracts ovate often squarrose, corolla scarcely  $\frac{3}{4}$  in. ventricose.

KHASIA and JAINTEA MTS., alt. 3–5000 ft., frequent; *Wallich*, &c.

A rather rigid shrub, 2–3 ft.; branches often scabrous, hairy, quadrangular. *Leaves*  $3\frac{1}{2}$  by 2 in., serrate, mature usually more or less hairy on both surfaces, not known to



occur blotched; nerves 9–11 pair. *Inflorescence* and *flowers* as of *S. maculatus*, but the bracts usually  $\frac{1}{8}$ – $\frac{1}{4}$  in. wide towards their base. *Seeds*  $\frac{1}{10}$  in. diam., pubescent.—Certainly closely allied to *S. maculatus*, and may be a high-level hairy form of it, as T. Anderson supposed; but besides the difference in the bracts fixed on by Nees the seeds are about double the diam., much more shortly dusky hairy.

86. ***S. petiolaris***, Nees in *DC. Prodr.* xi. 189, in part; leaves ovate acuminate at both ends mature nearly glabrous, spikes linear paniced hairy, bracts obovate-spathulate, corolla  $1\frac{1}{4}$  in. ventricose. *S. maculatus*, T. Anders. in *Journ. Linn. Soc.* ix. 473, chiefly.

SIKKIM and BHOTAN, alt. 3–10,000 ft., common; Griffith, T. Anderson, &c. ASSAM; Griffith.

A lax shrub, perhaps not specifically distinct from *S. maculatus*; the leaves are often spotted as on it, the small seeds are similar; but the bracts are much broader (as Nees states), and the corolla is much larger, usually purplish or even rose instead of lavender blue; nerves 7 pair, i. e. much more distant than in *S. maculatus* & *monadelphus*. The species reaches a very high level, the Alpine specimens being smaller with smaller leaves but equally large flowers.

VAR. *tubiflos*; spikes divaricate densely glandular-hairy, corolla (unexpanded) more than 1 in. the ventricose portion scarcely  $\frac{1}{6}$  in. diam.—Mishmee; Dailoo, Griffith (Kew Distrib. nn. 6095, 6103).—"Corolla deep blue; bracts lead-coloured" (Griffith's field-note).—This is very possibly a distinct species, though it must be closely allied to *S. petiolaris*; but it is very dangerous to assume the shape of the corolla from buds in this genus.

87. ***S. perfoliatus***, T. Anders. in *Journ. Linn. Soc.* ix. 471; leaves sessile lanceolate or elliptic much acuminate at both ends glabrous, spikes axillary cymose lax subcontinuous very viscid ciliate, bracts oblong linear-acuminate, capsule clavate 2-seeded. Endopogon integrifolius, Dalz. in *Hook. Kew Journ.* ii. 342; Dalz. & Gibs. *Bomb. Fl.* 185. *Leptacanthus alatus*, Wight  *Ic.* t. 1527.

W. DECCAN PENINSULA; Concan, Canara, Coorg, Law, Dalzell, &c.

Shrubby, nearly glabrous except the spikes. *Leaves* attaining 15 by  $4\frac{1}{2}$  in., more often 6 by  $1\frac{1}{4}$ – $2\frac{1}{2}$  in., very variable in size and in width, sparingly toothed, lineolate above; nerves 6–12 pair; petiole winged to the base, there dilated, auriculate, sometimes subdecurrent, never perfoliate. *Spikes* 2–5 in., closely cymed (or solitary) on very short axillary peduncles, very open, hardly interrupted even at the base in fruit; bracts  $\frac{3}{4}$  by  $\frac{1}{8}$  in.; bracteoles  $\frac{1}{2}$  in., linear. *Calyx*  $\frac{1}{3}$ – $\frac{1}{2}$  in. (elongate in fruit), divided nearly to the base, segments linear. *Corolla*  $1\frac{1}{4}$  in., straight, glabrous without, hairy within; cylindric base of the tube nearly as long as the ventricose part. *Stamens* included; longer filaments glabrous. *Ovary* glabrous, style thinly hairy. *Capsule*  $\frac{1}{3}$ – $\frac{1}{2}$  in., compressed. *Seeds*  $\frac{1}{6}$  in., ovate, shaggy; areoles hardly any.

88. ***S. glutinosus***, Nees in *Wall. Pl. As. Rar.* iii. 86, and in *DC. Prodr.* xi. 194; viscous hairy, leaves ovate acute, spikes short, lowest bracts leaf-like upper obovate or oblong shorter than the calyx, corolla 2 in. T. Anders. in *Journ. Linn. Soc.* ix. 476. *Ruellia glutinosa*, Wall. *Cat.* 2350. *R. Jacquemontiana*, Nees in *DC. Prodr.* xi. 145.

KASHMIR, GURWHAL, KUMAON and NEPAL; Wallich, Jacquemont, &c.

A shrub, 2–5 ft.; branches villous. *Leaves* 3 by  $1\frac{1}{2}$  in., base cuneate or rounded, crenate, villous on both surfaces; nerves 5–6 pair; petiole  $\frac{1}{4}$ – $\frac{3}{4}$  in. *Spikes* densely capitate, or more often the lowest flowers are remote, solitary, opposite in the axils of bract-like leaves; bract  $\frac{1}{4}$ – $\frac{1}{2}$  in., ovate, subfoliaceous, persistent; bracteoles  $\frac{1}{2}$  in., oblong. *Calyx*  $\frac{1}{3}$ – $\frac{1}{2}$  in., divided nearly to the base; segments linear, obtuse, viscous hairy. *Corolla* nearly glabrous; linear-cylindric base nearly as long as the ventricose part. *Stamens* glabrous. *Capsule*  $\frac{3}{4}$  in., viscous-pubescent, 4-seeded.



*Seeds*  $\frac{1}{8}$ – $\frac{1}{6}$  in., ovate, shaggy; areoles hardly any.—In spite of the enormous differences in the capsule and seeds, this plant has been much mixed with *Æchmanthera tomentosa*.

Series B. *Nudatæ*. *Bracts* caducous, often before the flowers expand. *Flowers* clustered or in distant mostly opposite pairs; not most of them scattered alternate. *Seeds* in all hairy.—(All, except *S. Newii* from N. India or Malay Peninsula.)

\* *Heads even in fruit capitate or ovate, not interrupted below.*

89. **S. geniculatus**, Clarke; nearly glabrous, leaves elliptic acuminate serrate, heads 2–3-fld., bracts large ovate acuminate caducous, bracteoles 0. *S. gracilis*, T. Anders. in Journ. Linn. Soc. ix. 474, not of Beddome.

MISHMEE; Griffith (Kew Distrib. n. 6116).

A small shrub; branches slender, somewhat zigzag. *Leaves* 5 by  $1\frac{3}{4}$  in., base cuneate or rhomboid, serrulate, upper surface dense with raphides; nerves 6–7 pair; petiole  $\frac{1}{2}$  in. *Peduncles* 1–3 in., with a node carrying two reduced caducous leaves at the middle, there geniculate and sometimes divided; heads  $\frac{3}{4}$  in., 2–4 outer bract-like leaves barren, early caducous; bract  $\frac{3}{4}$  by  $\frac{1}{4}$  in., lineolate. *Calyx*  $\frac{1}{4}$ – $\frac{1}{2}$  in., divided nearly to the base; segments linear, unequal, obtuse, glandular. *Corolla*  $1\frac{1}{4}$  in., glabrous, purple. *Capsule*  $\frac{2}{3}$  in., clavate, 4-seeded, glandular-pubescent. *Seeds*  $\frac{1}{10}$  in., ovate, shaggy; areoles small.—Each flower is subtended by one bract, and there are 2–4 outer empty similar bracts; before the expansion of the corolla all the bracts but 1 or 2 of the uppermost fall, and these disappear before fruit.

VAR. *integra*; leaves nearly entire, sepals in fruit nearly  $\frac{1}{2}$  in. hairy.—Khasia Mts.; Clarke. *Leaves* 5 by  $2\frac{1}{4}$  in., subovate; petiole  $\frac{1}{4}$ – $\frac{1}{2}$  in. *Seeds*  $\frac{1}{8}$  in. and upwards.—Probably merely the fully-developed state of *S. geniculatus*, which Griffith collected in a colder country.

90. **S. capitatus**, T. Anders. in Journ. Linn. Soc. ix. 475; leaves ovate acuminate at each end nearly glabrous, bracts elliptic-oblong herbaceous pubescent as long as the calyx, bracteoles half as long as the calyx, corolla  $1\frac{1}{4}$ –2 in. deep blue. *Ruellia capitata*, Wall. Cat. 2351, partly; Don Prodr. 120. *Goldfussia capitata*, Nees in Wall. Pl. As. Rar. iii. 88, and in DC. Prodr. xi. 173. *G. biceps*, Nees in Wall. Cat. 7161, and in Wall. Pl. As. Rar. iii. 88, and in DC. Prodr. xi. 172.—Acanthacea sp. Griff. Itin. Notes, 116, n. 213.

SUBTROPICAL HIMALAYA, alt. 1–5000 ft., from NEPAL to BHOTAN, common; Wallich, Griffith, H. f. & T., &c. PEGU; Karen Hills (fide T. Anderson).—DISTRIB. Ava.

A shrub, 1–3 ft. *Leaves* 6 by  $2\frac{3}{4}$  in., serrate, obscurely lineolate above, minutely hairy on the nerves beneath; nerves 6–7 pair; petiole  $1\frac{1}{4}$  in. *Peduncles* usually short,  $\frac{1}{2}$ –1 in., sometimes 2–4 in., glabrous or pubescent. *Heads* 1 in. diam., closely capitate even in fruit, many-fld., outer empty bracts sometimes long leaf-like, sometimes hardly half so long as the heads, caducous; bracts proper to each flower elongate upwards, closely adpressedly softly white pubescent; bracteoles  $\frac{1}{4}$ – $\frac{1}{3}$  in., ligulate, herbaceous, pubescent, caducous in fruit. *Calyx*  $\frac{1}{2}$  in., deeply divided but connate into a hardened short tube at the base; segments narrowly lanceolate, softly hairy even in fruit. *Corolla* curved, tubular-ventricose, nearly glabrous. *Stamens* glabrous. *Ovary* glandular; style thinly patently hairy. *Capsule*  $\frac{1}{2}$  in., slightly clavate, pubescent, 4-seeded. *Seeds*  $\frac{1}{8}$ – $\frac{1}{6}$  in., ovate, shaggy; areoles small.

VAR. *nitida*; heads larger shining glabrate in fruit, bracteoles nearly as long as the calyx obovate-oblong glabrous fimbriate in fruit.—Khasia Mts.; Mousto, alt. 2500 ft., Clarke.—*Bracts* and *bracteoles* shining scarious in fruit from a short green base. *Seeds*  $\frac{1}{3}$  in., densely silky.



91. **S. quadrangularis**, *Clarke*; leaves large subsessile broadly elliptic acuminate at both ends serrate minutely hairy, heads ovoid peduncled, bracts large ovate acute grey pubescent caducous, corolla  $1\frac{1}{2}$  in. pubescent without. *Ruellia quadrangularis*, *Wall. Cat.* 2358. *R. bracteata*, *Wall. Cat.* 2357 b only. *Goldfussia bracteata*, *Nees in Wall. Pl. As. Rar.* iii. 88, and in *DC. Prodr.* xi. 173.

NEPAL; *Wallich*. KUMAON; Mohargari, alt. 6500 ft., and Kalamundi, alt. 8500 ft., *Strachey & Winterbottom*.

*Stem* 2 ft., herbaceous, acutely quadrangular, somewhat pubescent upwards. *Leaves* 8 by  $3\frac{1}{2}$  in., shortly scabrous-setulose above, remotely minutely hairy beneath; nerves 13 pair. *Peduncles* 1–4 in., 1–2 in each axil or the uppermost-subumbellate, hairy, clavate, quadrangular upwards, 1-headed; heads in flower  $1\frac{1}{2}$  in.; bracts  $\frac{3}{4}$ –1 in., deciduous before the flowers expand; bracteoles 0. *Calyx*  $\frac{1}{3}$  in., distinctly gamosepalous, subequally 5-fid; segments linear-oblong, green, very viscidly golden-pubescent. *Corolla* in shape nearly as of *S. Dalhousianus*. *Capsule* not seen.

92. **S. pentstemonoides**, *T. Anders. in Journ. Linn. Soc.* ix. 477, in part; leaves elliptic acuminate at both ends glabrous, bracts orbicular concave whitened glabrous, bracteoles 0, calyx pubescent, corolla  $1\frac{1}{2}$  in. nearly glabrous pale purple. *Ruellia pentstemonoides*, *Wall. Cat.* 2340. *R. Cephalotes*, *Wall. Cat.* 2352. *R. capitata*, *Wall. Cat.* 2351, partly. *Goldfussia pentstemonoides*, *Nees in Wall. Pl. As. Rar.* iii. 88, and in *DC. Prodr.* xi. 175; *Wight Ic.* t. 1510.

SUBTROPICAL HIMALAYA, alt. 1–6000 ft., from NEPAL to BHOTAN, frequent; *Wallich, H. f. & T., &c.*

A much branched shrub, 3–8 ft. diam.; stems glabrous. *Leaves*  $6\frac{1}{2}$  by  $2\frac{1}{2}$  in., closely serrate, lineolate on both surfaces; nerves 7 pair; petiole  $\frac{1}{2}$  in. *Peduncles* 1–3 in., sometimes glandular-hairy, 1–2 together, mostly 1–3-headed; heads  $\frac{1}{2}$ –1 in., young exactly globular, outer bracts enclosing the heads; but in some of *Wallich's* examples the young heads are oblong-cylindric, strobiliform; bracts  $\frac{1}{4}$ – $\frac{1}{2}$  in., obtuse, early caducous. *Calyx*  $\frac{1}{4}$  in., in fruit often  $\frac{1}{2}$  in., divided nearly to the base, segments linear. *Corolla* more or less curved; narrow part of the tube sometimes minutely pubescent. *Stamens* glabrous. *Capsule*  $\frac{2}{3}$  in., oblong-clavate, glandular-pubescent, 4-seeded. *Seeds*  $\frac{1}{8}$  in., ovate, silky; areoles very small.

VAR. *flexuosa*; small, branches short flexuose rooting, peduncles long with 1 small head. *Ruellia flexuosa*, *Wall. Cat.* 2412. *Goldfussia flexuosa*, *Nees in Wall. Pl. As. Rar.* iii. 88, and in *DC. Prodr.* xi. 175.—“India,” *Herb. Wight*. Branches 1– $1\frac{1}{2}$  foot, apparently prostrate. *Leaves*  $2\frac{1}{2}$  by  $\frac{3}{4}$  in., thinly herbaceous; nerves 5 pair.—The example in *Herb. Wight* looks very unlike the Himalayan *S. pentstemonoides*; and, though taken up as a species by *Nees*, *T. Anderson* seems to have been so dissatisfied about it that he has left it out altogether. But there is a piece of the same thing mixed in *Wallich's* herbarium with *Ruellia Cephalotes* (*Wall. Cat.* 2352, type sheet); and it is probably an alpine starved (or cultivated?) form of *S. pentstemonoides*.

93. **S. Dalhousianus**, *Clarke*; leaves elliptic acuminate at both ends hairy, bracts orbicular concave whitened glabrous, bracteoles 0, calyx glabrate or sparingly hairy, corolla nearly 2 in. glabrous purple. *S. pentstemonoides*, *T. Anders. in Journ. Linn. Soc.* ix. 477, partly. *Goldfussia Dalhousiana*, *Nees in DC. Prodr.* xi. 174; *Wight Ic.* t. 1509.

W. TEMPERATE HIMALAYA, alt. 6–8000 ft.; from Kashmir to Kumaon, frequent; *Lady Dalhousie, Thomson, &c.*

A suberect shrub, 2–3 ft.; stems hairy. *Bracts* scarcely  $\frac{1}{4}$  in., caducous; outermost oblong, green upwards, small, not enclosing the heads. *Calyx* in the typical form glabrous, subscarios, lobes linear-oblong, sometimes minutely softly hairy.—United with *S. pentstemonoides* by *T. Anders.*, from which it differs in habit, in having much more hairy leaves and less hairy calyx. It also grows at a different level.



94. **S. multident**, *Clarke*; leaves ovate shortly acuminate at both ends minutely sparsely hairy on both surfaces, heads paniced viscous hairy, bracts small obovate viscous hairy deciduous, calyx viscous-pubescent, corolla  $1\frac{3}{4}$  in. purple.

SIKKIM, alt. 3-6000 ft.; *J. D. H.*, &c. BHOTAN; *Griffith*, *Herb. Propr.* n. 2398.

*Leaves*  $7\frac{1}{2}$  by 4 in., closely regularly serrate (often with more than 100 teeth to the leaf; both surfaces with few remote minute hairs and small scattered raphides. *Bracts*  $\frac{1}{4}$  in., very viscous-hairy; bracteoles  $\frac{1}{6}$  in., linear-oblong. *Capsule*  $\frac{3}{4}$  in., viscous-pubescent, 4-seeded. *Seeds*  $\frac{1}{3}$  in., subquadrate, fulvous-hairy; areoles sub-obsolete.—This is the so-called Sikkim *S. Dalhousianus*; it is nearer the true *S. pentstemonoides*, but the young heads are never glabrous globose as in that, and the panicle is compound very glandular-hairy. The corollas in Griffith's Bhotan example are not more than  $1\frac{1}{4}$  in., but are not thoroughly expanded.

95. **S. rhombifolius**, *Clarke*; leaves subsessile rhomboid-ovate shortly acute at both ends glabrous, bracts small elliptic concave caducous, bracteoles 0, corolla  $1\frac{1}{2}$ – $1\frac{3}{4}$  in. nearly glabrous. *Goldfussia sessilis*, *Nees in DC. Prodr.* xi. 172, not *Strobilanthes sessilis*, *Nees*.

ASSAM; *Jenkins*.

*Branches* long, subterete, glabrous. *Leaves* (often unequal)  $3\frac{1}{2}$  by 2 in., remotely serrulate, lineolate on both surfaces; nerves 5 pair. *Peduncles* 1–3 in., 1–3-headed; heads  $\frac{1}{2}$  in. diam., closely capitate; all the bracts early caducous. *Calyx* in flower  $\frac{1}{4}$ – $\frac{1}{3}$  in., divided nearly to the base; segments narrowly lanceolate, fuscous pubescent. *Corolla* nearly as of *S. pentstemonoides*, purple-mouthed. *Filaments* glabrous, longer hairy near the base. *Capsule* not seen.—This seems very near *S. pentstemonoides*, differing little but in the shape of the leaves; the heads however, by the time the first flowers expand, have lost all their bracts, which gives them a very different look.

96. **S. oligocephalus**, *T. Anders. ms. in Herb. Kew*; leaves elliptic caudate-acuminate nearly glabrous ciliate, young heads globose, bracts round concave glabrous, bracteoles 0, calyx hairy, corolla  $1\frac{1}{4}$  in. pubescent without dark-purple.—*Goldfussia* sp. n. 24, *Herb. Ind. Or. H. f. & T.*

UPPER SIKKIM, alt. 5-7000 ft.; *Yoksun*, *J. D. H.*, &c.

A small shrub, 1-2 ft.; branches slender, terete, glabrous. *Leaves* attaining  $6\frac{1}{2}$  by 3 in. (usually smaller much narrower), base cuneate, minutely remotely denticulate, sparingly thinly lineolate, sparsely puberulous especially toward the margins beneath; nerves 5-6 pair; petiole  $\frac{3}{4}$  in. *Bracts* as in *S. pentstemonoides*, but rather smaller. *Corolla* viscous-pubescent without, usually nearly black.—When dried hardly distinguishable from *S. pentstemonoides* but by the smaller heads and the ciliate leaves.

VAR.? *Treutleri*; heads slightly elongate, bracts ovate-lanceolate herbaceous hairy, bracteoles  $\frac{1}{6}$  in. linear, sepals  $\frac{2}{3}$ – $\frac{3}{4}$  in.—Sikkim, alt. 9-10,000 ft., frequent on Tonglo and Sundukphoo, *Treutler*, &c.

97. **S. dasyspermus**, *Kurz in Journ. As. Soc.* 1873, pt. ii. 94; leaves elliptic or ovate acuminate very sparsely minutely hairy, heads even in fruit capitate forming (by the falling of the floral leaves) quasi-panicles, bracts small oblong caducous, corolla 1 in. blue glabrous without.

PEGU; *Kurz*.

An erect, nearly glabrous herb, 3-4 ft. (*Kurz*); branches obscurely quadrangular. *Leaves*  $5\frac{1}{2}$  by  $2\frac{1}{2}$  in., base suddenly shortly acuminate (the uppermost and reduced floral leaves sessile cordate), crenate-serrate, subglabrous, minutely lineolate above; nerves 7-8 pair; petiole 0– $\frac{1}{3}$  in. *Heads* few-fl., glandular-hairy; peduncles  $\frac{1}{3}$ – $\frac{2}{3}$  in.; bracts  $\frac{1}{4}$  in.; bracteoles  $\frac{1}{8}$  in., obovate-oblong, caducous. *Calyx*  $\frac{1}{3}$ – $\frac{1}{2}$  in., divided nearly to the base; segments linear-ligulate. *Corolla* nearly straight; cylindric base



about as long as the moderately-widened ventricose part; segments ovate. *Filaments* and *style* sparsely hairy. *Capsule*  $\frac{1}{2}$  in., narrowly elliptic, pubescent upwards, 4-seeded. *Seeds*  $\frac{1}{8}$  in., ovate, silky; areoles hardly any.—Kurz rightly refers this to the neighbourhood of *S. pentstemonoides*.

98. **S. discolor**, *T. Anders. in Journ. Linn. Soc.* ix. 477; leaves elliptic cuspidate-acuminate glabrous, heads cymose running into compound panicles, bracts fugacious, calyx hairy, corolla  $1\frac{1}{4}$  in. nearly glabrous. *Goldfussia discolor*, *Nees in DC. Prodr.* xi. 172 (excl. West Himalayan examples).

BHOTAN, ASSAM, and KHASIA MTS.; *Griffith (Herb. Propr.* nn. 2399, 2400; *Kew Distrib.* nn. 6105, 6120).

A shrub, closely resembling *S. pentstemonoides* and *S. sessilis*; differing from the former in having the leaves more shortly petioled, less sharply toothed, the inflorescence more compound; from the latter in the leaves cuspidate acuminate. In the type examples of *Nees* the leaves are scarcely whitened beneath. *Bracts* not seen, oblong-lanceolate, *fide Nees*.

VAR. *nudicalyx*; leaves densely lineolate above coriaceous very white beneath, bracts  $\frac{1}{4}$  in. obovate, sepals glabrate lineolate. *Goldfussia* sp. n. 25, *Herb. Ind. Or. H. f. & T.*—Khasia, alt. 4000 ft.; Mausmai Falls, *Griffith (Kew Distrib.* n. 6120); Cherra, *H. f. & T.*—The type examples of this collected by J. D. H. look like a very distinct species; but some of the pieces of *Griffith* have the sepals glandular hairy.

99. **S. isophyllus**, *T. Anders. in Cat. Hort. Calcutt.* 43, and in *Journ. Linn. Soc.* ix. 478; leaves linear-lanceolate attenuate at both ends glabrous, heads numerous small cymed, bracts elliptic obtuse green shorter than the calyx, bracteoles nearly as long as the bracts, corolla 1 in. nearly glabrous lavender. *Goldfussia isophylla*, *Nees in Wall. Cat.* 7162, and in *Wall. Pl. As. Rar.* iii. 88, and in *DC. Prodr.* xi. 176; *Bot. Mag.* t. 4363; *Maund Bot.* t. 244. *Strobilanthes Goldfussia*, *Dalz. & Gibs. Bomb. Fl. Suppl.* 71, *excl. syn.*

KHASIA MTS., or adjoining parts of Silhet or Assam. All the examples are of cultivated plants.

A nearly glabrous, erect, very ramous shrub, 1–2 ft. *Leaves* 3 by  $\frac{1}{2}$ – $\frac{1}{2}$  in., opposite, subequal, entire or slightly serrulate, covered with raphides on both surfaces; nerves 4–5 pair; petiole 0– $\frac{1}{4}$  in. *Heads*  $\frac{1}{2}$  in. diam., 1–4-fld., terminal but appearing axillary cymed, the reduced leaves on the short axillary branches being caducous; bracteal leaves to the heads caducous; bract  $\frac{1}{3}$  in., green, nearly glabrous, subsistent; bracteoles  $\frac{1}{3}$  in., linear-oblong, green, nearly glabrous. *Calyx*  $\frac{1}{4}$  in., divided nearly to the base, pubescent; segments sublinear. *Corolla* curved; cylindric base much shorter than the ventricose portion, lobes short round. *Stamens* and *style* hairy. *Capsule* nearly  $\frac{1}{3}$  in., glabrous, 4-seeded. *Seeds*  $\frac{1}{10}$  in., ovate, silky; areoles hardly any.

100. **S. anisophyllus**, *T. Anders. in Cat. Hort. Calcutt.* 43, and in *Journ. Linn. Soc.* ix. 478; leaves very unequal or pseudo-alternate lanceolate acuminate at both ends glabrous, heads small often cymed, bracts elliptic obtuse green about as long as the calyx, bracteoles rather shorter than the bracts, corolla  $1\frac{1}{4}$  in. nearly glabrous lavender. *Ruellia anisophylla*, *Wall. Cat.* 2349; *Hook. Fl. Exot.* t. 191. *R. persicifolia*, *Griff. Itin. Notes*, 70; *Bot. Reg.* t. 955. *Goldfussia anisophylla*, *Nees in Wall. Pl. As. Rar.* iii. 88, and in *DC. Prodr.* xi. 176; *Bot. Mag.* t. 3404.

KHASIA MTS., alt. 1–4000 ft., common; *Wallich, &c.*

A shrub, 2–3 ft. *Leaves*  $3\frac{1}{2}$  by  $\frac{2}{3}$ –1 in.; the opposite leaf of each pair  $1\frac{1}{4}$  by  $\frac{1}{6}$  in. or obsolete.—Except in the unequal, rather broader leaves, this wholly agrees with



*S. isophyllus*; and as *S. isophyllus* cannot be found wild, it may prove to be a reversionary (under cultivation) form of *S. anisophyllus*.

101. ***S. cratægifolius***, *T. Anders. in Journ. Linn. Soc.* ix. 477; leaves subsessile elliptic or obovate crenulate glabrous, heads 1-5-fld. terminal solitary on numerous short leafy lateral branches hairy, bracts and bracteoles linear-oblong about as long as the calyx, corolla  $1\frac{1}{4}$  in. blue.

MOULMEIN; *Griffith, Parish.*

*Branches* elongate (15 in. at least), glabrous, subsimple with numerous shortened small-leaved lateral branches in opposite pairs each terminated by a flower-head. *Leaves*  $2\frac{1}{4}$  by 1 in. (those on the lateral branches  $\frac{1}{4}$ - $\frac{1}{2}$  in.), lineolate above, pale leathery beneath; nerves 6 pair. *Peduncles* 0- $\frac{1}{3}$  in.; bract  $\frac{1}{3}$ - $\frac{1}{2}$  by  $\frac{1}{8}$  in., green, prominently white-ciliate; bracteoles similar to, rather smaller. *Sepals*  $\frac{1}{3}$  in., linear-lanceolate, green, ciliate,  $\frac{1}{2}$  in. in fruit. *Corolla* nearly straight, glabrous; cylindric base much shorter than the ventricose portion. *Capsule*  $\frac{1}{2}$  in., broadly clavate-elliptic, minutely pubescent, 2-seeded. *Seeds*  $\frac{1}{2}$  in., fulvous-shaggy; areoles very small.

\*\* *Heads elongate mostly interrupted below, frequently all the flowers scattered or only a few at the tips of the spikes capitellate.*

102. ***S. lamiifolius***, *T. Anders. in Journ. Linn. Soc.* ix. 476, partly; leaves ovate acute nearly glabrous, young heads strobilate, bracts ovate acute scarcely pubescent, bracteoles oblong about as long as the calyx, corolla  $1\frac{1}{4}$ - $1\frac{1}{2}$  in. nearly glabrous. *Ruellia rotundifolia*, *Don Prodr.* 120. *R. lamiifolia*, *Wall. Cat.* 2347. *Goldfussia lamiifolia*, *Nees in Wall. Pl. As. Rar.* iii. 88, and in *DC. Prodr.* xi. 172.

NEPAL; *Wallich.*

*Stems* 15 in., flexuose, glabrous. *Leaves* 2 by  $1\frac{1}{4}$  in., base rounded or shortly acuminate, serrate, minutely pubescent on the nerves beneath, lineolate on the upper surface; nerves 6-7 pair; petiole  $\frac{1}{2}$  in. *Spikes* peduncled, mostly solitary, 1 in. in flower scarcely 2 in. not interrupted in fruit; bracts  $\frac{1}{2}$  in.; bracteoles  $\frac{1}{3}$  in., caducous. *Calyx*  $\frac{1}{3}$  in., in fruit  $\frac{1}{2}$  in., divided nearly to the base; segments linear-lanceolate, pubescent. *Corolla* purple (Nees). *Capsule*  $\frac{1}{2}$  in., pubescent, 4-seeded. *Seeds*  $\frac{1}{8}$  in., ovate, silky; areoles hardly any.

103. ***S. pauper***, *Clarke*; leaves lanceolate acuminate at both ends puberulous beneath or glabrate, heads oblong in fruit interrupted small or 1-fld., bracts obovate quadrate shorter than the calyx, corolla  $1\frac{1}{2}$  in. purple. *S. lamiifolius*, *T. Anders. in Journ. Linn. Soc.* ix. 476, partly.—*Goldfussia* sp. n. 26, *Herb. Ind. Or. H. f. & T.*

KHASIA MTS., alt. 4-6000 ft.; Nunklow and Nungbree, *H. f. & T.*, &c.

A meagre shrub, 1-2 ft.; branches upwards hairy or glabrate. *Leaves*  $3\frac{1}{2}$  by  $\frac{3}{4}$ -1 in., minutely toothed or subentire, densely obscurely lineolate; nerves 6-7 pair; petiole  $\frac{1}{2}$ -1 in. *Spikes* in fruit sometimes 2 in., usually shorter, or the flowers occasionally nearly all solitary; bracts scarcely  $\frac{1}{4}$  in., tip obtusely triangular, green, subpubescent, caducous; bracteoles  $\frac{1}{6}$  in., oblong, caducous. *Calyx*  $\frac{1}{4}$  in., in fruit  $\frac{1}{3}$  in., sub-5-partite; segments linear-spathulate, glandular-pubescent. *Corolla* nearly glabrous; narrow cylindric base nearly as long as the ventricose part. *Stamens* glabrous. *Capsule*  $\frac{1}{2}$  in., pubescent, 4-seeded. *Seeds*  $\frac{1}{10}$ - $\frac{1}{8}$  in., ovate, shaggy; areoles small.

104. ***S. extensus***, *Nees in DC. Prodr.* xi. 195; leaves subsessile ovate acuminate hairy base rounded or cordate, spikes long interrupted below, bracts ovate, corolla  $1\frac{1}{4}$ - $1\frac{1}{2}$  in. nearly glabrous purple. *T. Anders. in Journ. Linn. Soc.* ix. 476. *Goldfussia extensa*, *Nees in Wall. Cat.* 7160, and in *Wall. Pl. As. Rar.* iii. 88.



KHASIA MTS., alt. 4-6000 ft., common; Wallich, &c. ASSAM; Griffith, Mrs. Mack.

An erect shrub, 1-2 ft.; branches hairy. *Leaves*  $1\frac{1}{2}$  by  $\frac{3}{4}$  in., upper cordate sessile, lower sometimes short-petioled, serrate; nerves 5 pair, springing near the leaf-base. *Spikes* 2-6 in., terminal, hairy, dense at the tip, usually much interrupted below; the lowest flowers often distant solitary in the axil of altogether leaf-like persistent bracts; bract proper  $\frac{1}{4}$ - $\frac{1}{3}$  in., herbaceous, glandular, deciduous; bracteoles  $\frac{1}{5}$  in., elliptic. *Calyx*  $\frac{1}{3}$ - $\frac{1}{2}$  in. (or more in fruit), divided nearly to the base; segments linear-oblong, subobtuse, glandular-pubescent. *Corolla* curved; narrow cylindric base of the tube hardly so long as the ventricose part. *Filaments* glabrous; style thinly hairy. *Capsule*  $\frac{1}{2}$ - $\frac{2}{3}$  in., glandular-pubescent, 4-seeded. *Seeds*  $\frac{1}{8}$  in., ovate, hairy; areoles small.

105. **S. phyllocaulos**, Clarke; leaves short-petioled ovate acute hairy, spikes long dense interrupted below in fruit, bracts ovate, corolla  $1\frac{1}{4}$  in. nearly glabrous purple.

KHASIA MTS., alt. 5000 ft.; Moflong, J. D. H.; Dingling, Clarke.

*Stems* stout, hairy; internodes not half as long as the leaves. *Leaves*  $3\frac{1}{2}$  by  $1\frac{1}{2}$  in., without the acumination characteristic of *S. extensus*, base of the lower leaves shortly acuminate, serrations often 40-50 to the leaf (rarely 20 in *S. extensus*), upper surface softly densely adpressedly hairy, lower softly patentely hairy reticulately nervose; nerves 8 pair, subequally distant (not all springing near the base of the leaf). *Inflorescence, flowers and capsule* exactly as of *S. extensus*.—So unlike *S. extensus* in its densely leafy stem that it has been sorted in the Herbarium with *Æchmanthera leiosperma*, which it exceedingly resembles; but it is difficult to separate it from *S. extensus* by any technical character.

106. **S. Newii**, Beddome ms.; leaves petioled ovate acute pubescent, spikes much interrupted paniced, bracts lanceolate, corolla  $1\frac{1}{4}$ - $1\frac{1}{2}$  in. nearly glabrous purple. *S. extensus*, Bedd. Ic. Pl. Ind. Or. t. 202, not of Nees.

W. MYSORE; Manjeerabad, New (fide Beddome).

A small shrub; branches puberulous, glandular hairy towards the tips. *Leaves* 2 by  $1\frac{1}{4}$  in., base rounded or subcordate, serrate, puberulous scabrous above pubescent beneath; petiole  $\frac{1}{8}$ - $\frac{1}{6}$  in. (uppermost leaves sessile). *Panicles* 6-10 in.; flowers nearly all opposite distant. *Calyx and corolla* nearly as of *S. extensus*.—Col. Beddome published this as *S. extensus*, to which it is no doubt closely allied, but the leaves will not match, and the bracts are totally different, very hairy, early caducous, the bracteoles subobsolete.

107. **S. alatus**, Nees in DC. Prodr. xi. 194; leaves petioled ovate acute hairy, spikes early paniced, flowers all distant, bracts narrowly oblong caducous, corolla  $1\frac{1}{4}$  in. nearly glabrous purple. T. Anders. in Journ. Linn. Soc. ix. 476 (excl. Sikkim examples). *S. reflexus*, Nees l. c. 194. *S. attenuatus*, Nees l. c. 193 (excl. syn.). *Ruellia urticifolia*, Wall. Cat. 2346.

W. TEMPERATE HIMALAYA, alt. 6-10,000 ft., common; from Kashmir to Kumaon.—DISTRIB. N.E. Cabul.

A shrub, 2-4 ft., erect, viscous-hairy. *Leaves* 5 by  $2\frac{3}{4}$  in., upper sessile, lower long-petioled, base cordate rounded or attenuate, serrate; nerves 7-8 pair; petiole 1-3 in., linear or winged upwards. *Spikes* (by the early fall of the bracts) forming terminal panicles; upper flowers soon in distant pairs, not capitate; bracts narrow-lanceolate or oblong, caducous; upper hardly so long as the calyx; bracteoles  $\frac{1}{2}$  in., narrowly oblong, caducous. *Calyx*  $\frac{1}{4}$ - $\frac{1}{3}$  in., deeply divided; segments unequal, linear, obtuse, green, viscous-hairy. *Corolla* ventricose, mouth curved, constricted base hardly longer than the calyx, 2 hairy lines within. *Stamens* glabrous. *Ovary* glandular, style very remotely minutely hairy. *Capsule*  $\frac{3}{4}$  in., narrowly elliptic, glandular-hairy,



4-seeded. *Seeds*  $\frac{1}{2}$  in., ovate, shaggy; areoles hardly any.—The lower long-petioled leaves are usually cordate, but leaves acuminate at the base occur on the same plant. The species is better distinguished by the tips of the spikes having the flowers (quite early) spicate not capitate, and all the bracts very narrow; but the leaves about the base of the panicle are cordate ovate acuminate. Nees has written this species up under 3 names in the Kew Herbarium: as *S. alatus*, which is altogether right; as *S. attenuatus*, which is erroneous so far as he doubtfully meant it for *Ruellia attenuata*, Wall. & Nees (an *Echinacanthus*); and as *S. extensus*, which is a blunder.

108. **S. Lachenensis**, *Clarke*; leaves ovate attenuated at the base laxly hairy, spikes long interrupted at the base, bracts sessile elliptic truncate at the base exceeding the calyx caducous, corolla middle-sized glabrate without.

SIKKIM HIMALAYA; Lachen, alt. 10,000 ft., *J. D. H.*

*Branches* elongate, with lax white patent hairs. *Leaves*  $2\frac{1}{2}$  by  $1\frac{1}{2}$  in., obtuse or triangular, base (even in the uppermost) acuminate, decurrent. *Spikes* 2–5 in., solitary, simple; lower bracts  $\frac{1}{2}$  by  $\frac{1}{4}$  in., green, entire, exactly truncate, not at all cordate. *Corolla* (not expanded)  $\frac{2}{3}$  in., with a few scattered lax hairs towards the apex without.—This has been referred as a Sikkim form to *S. alatus*, to which it is certainly allied; but no one of the numerous examples of *S. alatus* will it match even reasonably well.

109. **S. collinus**, *Nees in Wall. Pl. As. Rar.* iii. 86, and in *DC. Prodr.* xi. 192; leaves large elliptic acuminate glabrous, spikes forming thin terminal pubescent panicles, bracts narrowly elliptic overtopping the calyx, corolla 2 in. nearly glabrous. *T. Anders. in Journ. Linn. Soc.* ix. 476. *Ruellia collina*, *Wall. Cat.* 2343.

PENANG; *G. Porter.*

*Branch-tips* stout, glabrous; internodes elongate. *Leaves*  $9\frac{1}{2}$  by  $3\frac{1}{2}$  in., base cuneate, repand-crenate, bearing raphides on both surfaces; nerves 7 pair; petiole  $\frac{2}{3}$  in. *Spikes* 3–4 in., with few flowers in remote opposite pairs, early running into a few-branched panicle; bracts  $\frac{1}{2}$  in., concave; bracteoles 0. *Calyx*  $\frac{1}{4}$ – $\frac{1}{3}$  in., divided nearly to the base; segments linear, with weak subulate pubescent tips. *Corolla* slightly curved, cylindric base as long as the ventricose part. *Capsule*  $\frac{2}{3}$  in., clavate-oblong, puberulous, 4-seeded. *Seeds*  $\frac{1}{8}$  in., ovate, shortly fulvous-hairy; areoles small.—Habit and calyx much like those of the large *Asystasias*, but the capsule and seeds are of *Strobilanthes*.

110. **S. lancifolius**, *T. Anders. in Journ. Linn. Soc.* ix. 480; leaves elliptic acuminate at both ends glabrous, spikes linear interrupted hairy collected into terminal panicles, bracts oblong obtuse green shorter than the calyx deciduous, corolla  $1\frac{3}{4}$  in. minutely pubescent without deep-blue.

MOULMEIN; *Parish.* TENASSERIM; *Beddome.*

A shrub; branches terete. *Leaves* 7 by 3 in., widest about the middle, serrate, minutely lineolate above; nerves 7–8 pair; petiole 1 in. *Spikes* ascending, straight; flowers nearly all in opposite pairs; bracts  $\frac{1}{4}$ – $\frac{1}{3}$  in.; bracteoles  $\frac{1}{4}$  in., linear-oblong, obtuse, deciduous. *Calyx*  $\frac{1}{3}$ – $\frac{1}{2}$  in., subequally divided nearly to the base; segments linear-oblong, obtuse, pubescent. *Corolla* nearly straight, funnel-shaped, ventricose upwards; segments ovate, dense rows of long white hair within. Longer *filaments* white hairy. *Capsule*  $\frac{2}{3}$  in., glabrate, 4-seeded. *Seeds* shaggy.

111. **S. denticulatus**, *T. Anders. in Journ. Linn. Soc.* ix. 483; leaves long-petioled elliptic acuminate at both ends fuscous-pubescent on the nerves beneath, spikes linear interrupted fuscous-pubescent, flowers (or many of them) in distant pairs, bracts lanceolate. *Ruellia denticulata*, *Wall. Cat.* 2418. *Asystasia denticulata*, *Nees in Wall. Pl. As. Rar.* iii. 89, and in *DC. Prodr.* xi. 164.

KHASIA MTS.; *Wallich.* PATKOYE MTS. (in S.E. Assam), at the river Namyoon (by error Kamyoon in Griffith's Journals); *Griffith* (Kew Distrib. n. 6112).



A shrub; branches quadrangular, scabrid puberulous upwards. *Leaves* 6 by  $2\frac{1}{2}$  in., crenulate-dentate, with small raphides on both surfaces, paler beneath; nerves 12 pair; petiole  $\frac{1}{2}$ –3 in. (often very unequal in the opposite pairs). *Spikes* 1–4 in., axillary, 1 or 2 together, interrupted, slender even before flower-time; bracts  $\frac{1}{4}$ – $\frac{1}{3}$  in., green, slightly pubescent; bracteoles  $\frac{1}{3}$  in. *Calyx*  $\frac{1}{4}$ – $\frac{1}{3}$  in., divided nearly to the base; segments lanceolate, scarcely acute, fuscous-pubescent. *Corolla*  $1\frac{1}{4}$  in., pubescent without, nearly straight; linear-cylindric part of the tube nearly as long as the ventricose part. *Filaments* very hairy (Nees). *Capsule* not seen.

112. **S. microcarpus**, *T. Anders. in Journ. Linn. Soc.* ix. 482; leaves large petioled ovate acuminate coarsely serrate hirsute on both surfaces, flowers paniced distant mostly in opposite pairs, bracts and bracteoles very small, corolla  $\frac{3}{4}$  in. glabrous without.

TENASSEMBIM or ANDAMANS; *Helfer* (Kew Distrib. n. 6113).

A shrub; branches terete, swollen at the nodes, glabrous. *Leaves* 8 by  $4\frac{1}{2}$  in., base broadly rhomboid, hirsute with white hairs which are stellately clustered on the upper surface, closely minutely lineolate on both surfaces; nerves 15 pair; petiole  $1\frac{1}{2}$ –2 in. *Inflorescence* viscidly glandular-hairy; spikes proper apparently laxly few-fl., axillary and running into a terminal panicle; bracts  $\frac{1}{3}$  in., linear; bracteoles similar to the bracts. *Calyx*  $\frac{1}{3}$  in., divided nearly to the base, viscous; segments linear, more or less unequal. *Corolla* nearly straight, very hairy within; cylindric base much shorter than the ventricose portion; segments short. *Capsule* scarcely  $\frac{1}{3}$  in., clavate, 2-seeded where examined.—*Helfer's* examples are in bad condition, with the leaves (both cauline and floral) all detached; and the species very possibly is not placed here correctly.

113. **S. angustifrons**, *Clarke*; leaves elliptic acuminate at both ends nearly glabrous, spikes lateral and terminal paniculate with capitellate tips, bracts oblong acuminate caducous, corolla  $1\frac{1}{2}$  in. nearly glabrous purple.—*Strobilanthes* sp. n. 29, *Herb. Ind. Or. H. f. & T., partly*. *Goldfussia Edgeworthiana*, *Nees in DC. Prodr.* xi. 173?

N.W. HIMALAYA; Deyra, alt. 2500 ft., *Thomson*; Kangra and Dhurmsala, alt. 3–6000 ft., *Clarke*.

A suberect shrub, 2–3 ft.; branches glabrous. *Leaves*  $4\frac{1}{2}$  by  $1\frac{3}{4}$  in., upper all attenuate at the base, serrulate, upper surface and margin minutely hairy or glabrous, raphides small on both surfaces; nerves 6 pair; petiole  $\frac{1}{2}$  in. *Spikes* forming short irregular panicles, branches nearly glabrous; lower bracts leaf-like, lanceolate (base never cordate), upper shorter than the calyx; bracteoles  $\frac{1}{6}$  in., linear, scarcely pubescent. *Sepals*  $\frac{1}{3}$ – $\frac{1}{2}$  in., linear, pubescent. *Corolla* nearly as of *S. alatus*, but much narrower. *Capsule*  $\frac{1}{3}$ – $\frac{1}{2}$  in., sparsely pubescent, 4-seeded. *Seeds* scarcely  $\frac{1}{8}$  in., orbicular, hairy; areoles hardly any.—This differs from *S. alatus* by the slenderer corolla, capsule and seeds, and by the uppermost leaves being narrowed never cordate at the base.

114. **S. agrestis**, *Clarke*; leaves ovate acuminate at both ends sparsely hairy on both surfaces, spikes elongate paniculate with capitellate tips, bracts shorter than the calyx obovate pubescent caducous, corolla 2 in. glabrous without.

SUBTROPICAL SIKKIM and W. BHOTAN, alt. 2–5000 ft., frequent; *Clarke*.

An erect, branched undershrub, 1–2 ft.; branches upwards quadrangular, pubescent. *Leaves* 4 by 2 in., often unequal, shortly acuminate at the base, serrulate, shortly sparsely hairy above, minutely pubescent beneath, minutely lineolate on both surfaces; nerves 6 pair; petiole  $\frac{1}{4}$ – $\frac{1}{2}$  in. *Spikes* 1–4 in., hairy, lower flowers in distant pairs; bracts  $\frac{1}{4}$  in.; bracteoles  $\frac{1}{6}$  in., linear-oblong. *Corolla* slightly curved, rather narrowly tubular-ventricose, lavender colour. *Capsule* and *seeds* as of *S. angustifrons*, to which it is nearly allied.

VAR. *hemiotis*; one leaf of every pair sessile cordate less than  $\frac{1}{4}$  the length of the other.—Khasia Mts., *Herb. Watt*.



115. **S. Thomsoni**, *T. Anders. in Journ. Linn. Soc.* ix. 478; leaves ovate or elliptic acuminate at both ends glabrous, spikes short cymose or fascicled axillary shorter than the leaves glabrous or viscous-hairy, bracts and bracteoles very small, corolla  $1\frac{1}{4}$  in. purple.—*Strobilanthes* sp. n. 30, *Herb. Ind. Or. H.f. & T.*

SUBTROPICAL SIKKIM and W. BHOTAN, alt. 2–6000 ft., common; *J. D. H.*, *T. Anders.*, &c.

A shrub, 3–5 ft.; branches elongate, flexuose, glabrous. *Leaves*  $4\frac{1}{2}$ – $6\frac{1}{2}$  by  $2\frac{1}{2}$  in., serrate, with small raphides on both surfaces; nerves 6 pair; petiole  $\frac{1}{2}$ – $\frac{3}{4}$  in., sometimes 0. *Spikes* 1–3 in., in nearly all the axils, densely divided from the base, the flowers nearly all in crowded but distinct opposite pairs; lower bracts resembling reduced leaves, lanceolate; upper  $\frac{1}{6}$  in. spathulate, glabrous pubescent or very viscous-hairy. *Calyx* in flower often less than  $\frac{1}{2}$  in., in fruit sometimes nearly  $\frac{1}{2}$  in., divided nearly to the base; segments equal or unequal, glaucous or green, hairy. *Corolla* somewhat curved, minutely pubescent, ultimately glabrate. *Capsule* scarcely  $\frac{1}{3}$  in., minutely pubescent, 4-seeded. *Seeds*  $\frac{1}{16}$  in., orbicular, innumerable fine white hairs springing out on applying water; areoles very small.—There is a wide series of forms here collected, varying much in the size and hairiness of the calyx, but all remarkable by the fasciculate axillary inflorescence. Possibly *T. Anderson* also included here *S. agrestis*, which has different inflorescence, and much larger capsules.

116. **S. lævigatus**, *Clarke*; nearly glabrous, leaves elliptic acuminate at both ends serrate, flowers loosely paniced nearly all in opposite distant pairs, bracts very caducous, corolla  $1\frac{3}{4}$  in. nearly glabrous.

SIKKIM; *J. D. H.*

A shrub, glabrous except a few glandular hairs occasionally on the calyx and panicle-rachis. *Leaves* 7 by  $2\frac{1}{2}$  in., sharply serrate, obscurely lineolate, nerves 8 pair; petiole  $\frac{3}{4}$  in. *Panicles* axillary and terminal, large, lax; bracts and bracteoles all fallen before some of the corollas have opened. *Calyx*  $\frac{1}{3}$  in., divided nearly to the base; segments subequal, narrowly lanceolate, subobtuse, somewhat enlarged, membranous in fruit. *Corolla* nearly as of *S. angustifrons* & *agrestis*. *Capsule*  $\frac{1}{2}$ – $\frac{2}{3}$  in., glabrous, tip obscurely glandular.

117. **S. debilis**, *Clarke*; leaves small elliptic sparsely hairy, spikes small interrupted, flowers in opposite pairs, bracts linear-lanceolate, corolla 1 in. nearly glabrous without long white-hairy within.

PEGU; *Kurz.*

*Stem* creeping, rooting; flowering branches 4–8 in., erect, branching, pubescent. *Leaves*  $1\frac{1}{2}$  by  $\frac{2}{3}$  in., apex triangular, very obtuse, base cuneate, undulate or crenate, densely lineolate and with a few long multicellular hairs above, pubescent beneath; nerves 5 pair; petiole  $\frac{1}{8}$  in. *Spikes* 1–2 in., weak, hairy; bracts  $\frac{1}{3}$  in.; bracteoles  $\frac{1}{4}$ – $\frac{1}{3}$  in., linear, green, hairy. *Sepals*  $\frac{1}{4}$ – $\frac{1}{3}$  in., linear, subulate, very hairy. *Corolla* nearly straight; cylindric base hardly half as long as the urceolate part; segments 5, short, round, subequal. *Filaments* glabrous. *Ovary* 4-ovulate. *Capsule* not seen.—A very anomalous species; it is possible that the bracts are not caducous, and that it should not be arranged here.

118. **S. glandulosus**, *Kurz in Journ. As. Soc.* 1873, ii. 92; viscous, leaves narrowly elliptic repand-crenate, spikes very numerous, lowest bracts leaf-like subpersistent, proper bracts small oblong caducous, corolla scarcely  $\frac{1}{3}$  in. yellow. *Hemigraphis glandulosa*, *T. Anders. in Kurz Andaman Rep. App.* B. 13.

S. ANDAMAN ISLANDS; *Kurz.*

A branched herb (*Kurz*). *Leaves* 3 by 1 in., subobtusely cuneate at both ends nearly glabrous; nerves 6 pair; petiole  $\frac{1}{4}$  in. *Inflorescence* exceedingly sticky, very compound; lower bracts persistent, or deciduous forming the spikes into compound panicles; flowers distant in opposite pairs, or in small heads; or in appearance solitary,



terminal, pedicelled. *Calyx*  $\frac{1}{4}$ – $\frac{1}{3}$  in., divided nearly to the base; segments linear. *Corolla* straight, tubular-ventricose, hardly  $\frac{1}{8}$  in. diam.; segments short, round. *Filaments* and *style* glabrous; ovary 4-ovulate. *Capsule*  $\frac{1}{3}$  in., clavate, compressed, pubescent, 4-seeded. *Seeds*  $\frac{1}{2}$  in., orbicular; when wetted the fine hairs spring out; areoles very small.—Kurz, after removing this species to *Strobilanthes*, suggests that it is allied to *Hemigraphis Griffithiana*, of which not merely the ovules, but the inflorescence, &c., are totally different.

119. **S. secundus**, *T. Anders. in Journ. Linn. Soc.* ix. 480; leaves elliptic acute at both ends nearly glabrous, spikes lax long, flowers distant in opposite pairs, bracts petioled ovate deciduous, corolla  $1\frac{1}{2}$  in. minutely pubescent without yellow with a brown-purple tube.—*Strobilanthes* sp. n. 23, *Herb. Ind. Or. H. f. & T.*, partly.

MISHMEE and ASSAM; *Griffith* (Kew Distrib. n. 6122). ASSAM; *Simons*.

*Leaves*  $6\frac{1}{2}$  by 3 in., crenate or subentire, ashy puberulous on the nerves beneath otherwise glabrous, upper surface with minute raphides; nerves 8 pair; petiole  $\frac{1}{2}$  in. *Spikes* 12 in., whip-like, sparingly branched (in *Griffith's* type specimens), sometimes depauperated 3 in., 5-fld.; lower bracts leaf-like, upper gradually smaller, leaf-like, deciduous, uppermost only  $\frac{1}{3}$  in., lanceolate; bracteoles obsolete. *Calyx*  $\frac{1}{2}$  in., divided nearly to the base, glabrous, enlarged in fruit; segments unequal, narrowly lanceolate, linear-elongate, subobtus. *Corolla* curved, cylindric base hardly so long as the calyx. *Capsule* nearly 1 in., base long barren narrow, 4-seeded. *Seeds*  $\frac{1}{8}$ – $\frac{1}{6}$  in., ovate, shaggy; areoles very small.

120. **S. flaccidifolius**, *Nees in DC. Prodr.* xi. 194; glabrous, leaves elliptic acute at both ends, spikes forming somewhat dense panicles, flowers opposite many remote, bracts petioled ovate deciduous, corolla 2 in. nearly glabrous purple. *T. Anders. in Journ. Linn. Soc.* ix. 481. *S. Championi*, *T. Anders. in Benth. Fl. Hongk.* 261. *S. flaccidus*, *Mann, Assam For. Rep.* 1876-7, par. 135; *Gamble, Man. Ind. Timb.* 280; *Kurz For. Fl.* ii. 239. *Ruellia indigofera*, *Griff. Trav.* 237. *R. indigotica*, *Fortune, Resid. Chin.* 158. *Balfour, Cyclop. Ind. IV. (Ruellia)*. *R. Cusia*, *Ham. in Wall. Cat.* 2386. *Goldfussia Cusia*, *Nees in Wall. Pl. As. Rar.* iii. 88, and in *DC. Prodr.* xi. 175. *Dipteracanthus? calycinus*, *Champ. in Hook. Kew Journ.* v. 133.

N. and E. BENGAL with ASSAM, alt. 1–4000 ft. in the lower hills, often cultivated, *Hamilton, Griffith, &c.*—DISTRIB. N. Burma, S. China.

A shrub. *Leaves* and *flowers* closely resembling (when dry) those of *S. secundus*, but the inflorescence denser, the flowers rather larger. *Capsule*  $\frac{3}{4}$  in., not constricted at the base; lower seeds less than  $\frac{1}{4}$  in. from the base.—Except as to the capsule, this looks exceedingly like a cultivated form of *S. secundus*. Yields the dye “Room.”

Series C. *Alternifloræ*. *Bracts* persistent or caducous, large or small, in opposite pairs (sometimes unequal) one of each pair mostly barren. *Spikes* linear lax usually interrupted often flexuose, zigzag or twisted, or compound passing into much-branched panicles; spikes upwards at least generally sympodal. *Flowers* mostly distant, alternate.—(Several species in this section have some of their flowers opposite, but these are in such case often twisted much to one side; and in many cases where such occur as solitary in the axils of leaves, they are really alternate on shortened axillary branches with 2 opposite bracts, whereof one only contains a flower.)—Species of N. India and the Malay Peninsula.

121. **S. divaricatus**, *T. Anders. in Journ. Linn. Soc.* ix. 478; leaves lanceolate or elliptic acuminate at both ends glabrous, spikes axillary and terminal elongate flexuose or zigzag, flowers distant both paired and alter-



nate, bracts very small caducous, corolla  $1\frac{1}{2}$  in. nearly glabrous purple. *Ruellia divaricata*, *Wall. Cat.* 2372. *Goldfussia divaricata*, *Nees in Wall. Pl. As. Rar.* iii. 89, and in *DC. Prodr.* xi. 176.—*Strobilanthes* sp. n. 23, *Herb. Ind. Or. H. f. & T.*, partly.

TEMPERATE HIMALAYA, alt. 5–9000 ft., from Nepal to Bhotan, common; *Wallich*, &c. KHASIA MTS., alt. 3–5000 ft., frequent; *H. f. & T.*, &c.

A shrub, 2–5 ft., nearly glabrous. *Leaves*  $5\frac{1}{2}$  by 2 in. (in the Himalaya plant usually narrower), serrulate, obscurely setulose; nerves 7 pair; petiole  $\frac{1}{3}$  in. *Spikes* very lax, divaricate; glabrous or (in the Khasia form) thinly hairy upwards. *Bracts*  $\frac{1}{6}$  in., ovate, caducous; bracteoles  $\frac{1}{8}$ – $\frac{1}{6}$  in., obovate-oblong, caducous. *Calyx*  $\frac{1}{3}$ –1 in., subequally divided to the base; segments narrow elongate caudate, often glabrous in the Himalaya form, usually hairy (sometimes very hairy in fruit) in the Khasia form. *Corolla* curved, tubular, ventricose, subviscid dark purple, glossy in the high-level Himalaya plant. *Stamens* glabrous or the filaments minutely pubescent at the base. *Capsule*  $\frac{1}{2}$  in., glabrate, 4-seeded. *Seeds*  $\frac{1}{10}$  in., ovate, pubescent; areoles small.

122. ***S. rubescens***, *T. Anders. in Journ. Linn. Soc.* ix. 479; lower leaves subsessile oblong acuminate subentire coriaceous hairy or glabrate, spikes curved, flowers mostly remote not opposite, bracts very small ovate, corolla nearly 2 in., seeds  $\frac{1}{3}$  in.—*Goldfussia* sp., *Griff. Itin. Notes*, 20, n. 309. *Goldfussia* sp. n. 27, *Herb. Ind. Or. H. f. & T.*, in great part.

KHASIA and JAINTIA MTS., alt. 3–5000 ft., common; *Griffith. H. f. & T.*, &c.

Suberect flexuose, or lax curved, 1–2 ft., hairy or glabrous. Lower *leaves*  $3\frac{1}{2}$  by  $1\frac{1}{4}$  in. with petiole rarely  $\frac{1}{6}$  in., upper cordate sessile, sparsely lineolate above; nerves 5 pair. *Spikes* 1–5 in., axillary, and forming a quasi-terminal panicle, secund, glabrous or sparingly glandular-hairy; bracts scarcely  $\frac{1}{8}$  in., ovate, opposite, usually only one bearing a flower; bracteoles nearly as long as the bracts, linear. *Calyx*  $\frac{1}{3}$ – $\frac{1}{2}$  in., divided nearly to the base; segment linear-lanceolate, somewhat enlarged in fruit. *Corolla* nearly straight, glabrous, purple or lilac; cylindric base  $\frac{1}{3}$  in., ventricose part 1 in. *Capsule*  $\frac{1}{2}$ – $\frac{2}{3}$  in., glabrous, 4-seeded. *Seeds* ovate, shaggy principally on the margin; areoles small.

VAR. ? *microsperma*; leaves more distinctly serrate lower sessile cordate, capsule scarcely  $\frac{1}{3}$  in., seeds  $\frac{1}{10}$  in.—Khasia Mts., alt. 4–5000 ft., *H. f. & T.* Darjeeling; Jor Bungalow, alt. 7500 ft., *Beddome*.—The small seeds appear perfectly ripe. Col. Beddome's Darjeeling plant may be a new species.

123. ***S. boerhaavioides***, *T. Anders. in Journ. Linn. Soc.* ix. 479; lower leaves long-petioled ovate acuminate crenate glabrate, spikes curved, flowers mostly remote not opposite, bracts very small ovate, corolla  $1\frac{1}{2}$  in., seeds  $\frac{1}{6}$  in.—*Goldfussia* sp. n. 27, *Herb. Ind. Or. H. f. & T.*, in part.

SIKKIM HIMALAYA; *Thomson*. KHASIA MTS., alt. 4–5000 ft.; Pomrang, *J. D. H.*

Lower leaves  $6\frac{1}{2}$  by 3 in.; petiole 1– $1\frac{1}{2}$  in., winged upwards. Otherwise so closely resembling *S. rubescens* type, that the species have been thrown into one in *Herb. Kew*.

124. ***S. Helictus***, *T. Anders. in Journ. Linn. Soc.* ix. 479; leaves lanceolate or elliptic acuminate at both ends glabrous, spikes elongate zigzag twisted glabrous or viscous hairy, bracts linear shorter than the calyx, corolla  $1\frac{1}{4}$  in. creamy-white. *Ruellia calycina*, *Wall. Cat.* 2417. *Asystasia calycina*, *Nees in Wall. Pl. As. Rar.* iii. 90. *Echinacanthus calycinus*, *Nees in DC. Prodr.* xi. 168.

SIKKIM, alt. 6000 ft.; *Treutler*. KHASIA and JAINTIA MTS., alt. 4000 ft. frequent; *Griffith*, &c.

A shrub, 1–4 ft.; branches sometimes pubescent upwards. *Leaves*  $4\frac{1}{2}$  by 1– $1\frac{1}{4}$  in. lanceolate (in the Sikkim example  $4\frac{1}{4}$  by 2 in. elliptic), serrate; upper surface lineo-



late; nerves 5–9 pair; petiole  $\frac{3}{4}$  in. *Spikes* 3–8 in., axillary and terminal, but little branched; flowers all distant alternate; bracts  $\frac{1}{3}$ – $\frac{1}{2}$  in., unequal, opposite, the smaller one barren; bracteoles  $\frac{1}{8}$  in., linear. *Calyx*  $\frac{1}{2}$ – $1\frac{1}{4}$  in., divided subequally nearly to the base; segments linear, glabrous or very viscid hairy, more or less enlarged in fruit. *Corolla* nearly glabrous, very ventricose from a constricted base scarce  $\frac{1}{4}$  in. long; segments short, round. *Stamens* 4, filaments very hairy downwards. *Capsule*  $\frac{3}{4}$  in., glabrous, 4-seeded. *Seeds*  $\frac{1}{8}$  in., ovate, pubescent hair at first dense white, ultimately tawny less; areoles very small.—T. Anderson says the leaves are “softly tomentose beneath,” which is a mistake.

125. **S. Griffithianus**, *T. Anders. in Journ. Linn. Soc.* ix. 481; leaves broadly lanceolate acuminate at both ends puberulous on the nerves beneath, spikes elongate zigzag viscid pubescent, flowers distant alternate, bracts lanceolate obtuse persistent, corolla  $1\frac{3}{4}$  in. yellow. *Triænanthus Griffithianus*, *Nees in DC. Prodr.* xi. 169.

KHASIA MTS., alt. 2–3000 ft., *Griffith, J. D. H.*, &c., frequent on the southern face.

A spreading shrub, 3–7 ft. diam.; branches fuscous-puberulous upwards. *Leaves* 6 by  $1\frac{1}{2}$  in., minutely denticulate; nerves 10 pair; petiole  $\frac{3}{4}$  in. *Spikes* 3–8 in., lateral and in lax terminal panicles; bracts 1 in., opposite, more or less unequal, one of each pair supporting a flower; bracteoles  $\frac{1}{4}$  in., linear-oblong. *Calyx*  $\frac{1}{3}$ – $\frac{1}{2}$  in., divided subequally very nearly to the base; segments (one a little longer than the other 4) linear-oblong, green, viscid-pubescent. *Corolla* nearly straight glabrous, yellow with brown or red spots or lines; linear-cylindric base of the tube about as long as the ventricose part. *Filaments* very hairy. *Capsule*  $\frac{3}{4}$  in., nearly glabrous, 4-seeded. *Seeds*  $\frac{1}{8}$ – $\frac{1}{6}$  in., fulvous-hairy; areoles very small.—Nees erected this plant into a genus on the ground that the calyx was 2-lipped with one lip trifold but half-way down; an error of fact.

126. **S. paucinervius**, *T. Anders. in Herb. Kew*; glabrous, leaves elliptic acuminate, spikes linear elongated interrupted flexuose alternate-fld., bracts lanceolate persistent.

TENASSERIM or ANDAMAN ISLANDS; *Helpfer* (Kew Distrib. n. 6115).

Apparently a lax shrub. *Leaves*  $4\frac{1}{2}$  by  $1\frac{1}{2}$  in., base rhomboid, subentire or minutely denticulate, lineolate on both surfaces; nerves 5–6 pair; petiole  $\frac{1}{6}$  in. *Spikes* 2–4 in., axillary, short peduncled, 1 or 2 together; bracts  $\frac{1}{2}$  in., bracteoles nearly as long, narrower, persistent. *Calyx* subequally 5-fid nearly to the base; segments linear-lanceolate acute. *Capsule*  $\frac{3}{4}$  in., glabrous, 4-seeded. *Seeds*  $\frac{1}{6}$  in., ovate, shaggy; areoles hardly any.

127. **S. elongatus**, *Clarke*; glabrous, leaves lanceolate acuminate, spikes very long lax, flowers alternate and opposite distant, bracts lanceolate persistent, sepals linear-lanceolate rather longer than the bracts.

ASSAM; Namroop, *Griffith* (Kew Distrib. n. 6183).

A shrub. *Leaves*  $4\frac{1}{4}$  by  $1\frac{1}{4}$  in., base cuneate, minutely serrate, densely lineolate above; nerves 11 pair; petiole  $\frac{1}{4}$  in. *Spikes* axillary and quasi-terminal, 1 or 2 together, attaining 7 in., sparingly branched, leafless; bracts in opposite pairs, all distant, both or one or neither bearing a flower,  $\frac{1}{3}$  by  $\frac{1}{10}$  in.; bracteoles linear, shorter than the bracts. *Sepals*  $\frac{1}{3}$  in., glabrous. *Corolla* not seen. *Capsule*  $\frac{1}{4}$ – $\frac{1}{3}$  in., 4-seeded, glabrous. *Seeds* compressed, orbicular, subelastically hairy.

128. **S. farinosus**, *Clarke*; leaves elliptic acuminate at each end serrate glabrous, spikes in a pubescent panicle, flowers distant alternate, bracts very small persistent, corolla  $1\frac{1}{2}$  in. nearly glabrous without.

MOULMEIN; Thoung Yun, *Lobb*.

*Branch* terete, glabrous. *Leaves* 5 by  $1\frac{3}{4}$  in., upper surface lineolate, lower pale; nerves 7 pair; petiole  $\frac{3}{4}$  in. *Spikes* axillary, and a terminal panicle 4 in. diam.;



bracts  $\frac{1}{8}$  in., elliptic, pubescent, opposite one of each pair usually barren; bracteoles oblong rather longer than the bracts. *Calyx*  $\frac{1}{4}$ – $\frac{1}{3}$  in., divided subequally nearly to the base; segments linear-ligulate, softly pubescent, densely white papillose down the back. *Corolla* nearly straight, much ventricose upwards, constricted base of the tube short. *Style* glabrous. *Capsule*  $\frac{3}{4}$  in., spathulate-oblong, puberous, 4-seeded. *Seeds*  $\frac{1}{8}$ – $\frac{1}{6}$  in., ovate, shaggy; areoles very small.—The papillæ on the backs of the sepals (and continued also on the bracts) give this species a powdered or farinose look.

129. **S. nobilis**, *Clarke*; leaves elliptic acuminate at both ends sparsely hairy on the nerves beneath, spikes long flexuose paniced pubescent, flowers alternate, bracts lanceolate acute persistent.

JAINTEA HILLS; Jarain, alt. 3500 ft., *Clarke*.

An erect gregarious shrub, 6–10 ft. *Leaves* 9 by 3 in., unequal-sided, upper sessile, serrate, thinly lineolate above; nerves 10 pair. *Spikes* 6–12 in., hardly interrupted; bracts  $\frac{3}{4}$ –1 in., very acuminate, minutely hairy; bracteoles  $\frac{3}{4}$  in., linear-lanceolate. *Calyx*  $\frac{2}{3}$  in., divided nearly to the base equally; segments linear, minutely scabrous-pubescent. *Capsule*  $\frac{3}{4}$  in., nearly glabrous, 4-seeded. *Seeds*  $\frac{1}{6}$  in., ovate, shaggy; areoles very small.—*Corolla* not preserved, believed to be yellow.

130. **S. inflatus**, *T. Anders. in Journ. Linn. Soc.* ix. 476; villous, leaves elliptic or subovate acuminate, flowers alternate or some opposite in flexuose or twisted 1-sided spikes, lower bracts leaf-like upper spathulate, corolla  $1\frac{1}{2}$  in. much curved pubescent without.—*Goldfussia* sp. n. 28, *Herb. Ind. Or. H. f. & T.*

SIKKIM HIMALAYA, alt. 5–8000 ft.; *J. D. H.*

*Branches* woody, flexuose, terete, fulvous-villous. *Leaves*  $2\frac{1}{4}$  by  $\frac{3}{4}$ – $1\frac{1}{4}$  in., serrate, hairy on both surfaces; nerves 6 pair; petiole  $1\frac{1}{4}$  in. *Spikes* 1–3 in., fulvous villous, internodes zigzag or contorted almost as in *S. Helictus*; most of the bracts foliaceous; bracteoles minute linear. *Corolla* funnel-shaped, inflated, tube very much curved towards the top; segments subquadrate orbicular. *Capsule*  $\frac{2}{3}$  in., narrowly elliptic, glabrous, 4-seeded. *Seeds*  $\frac{1}{6}$  in., subquadrate, shaggy; areoles subobsolete.—Nearly all the bracts are leaf-like, persistent; the uppermost, entirely bracteiform ones, are deciduous.

131. **S. Wallichii**, *Nees in Wall. Pl. As. Rar.* iii. 87, and in *DC. Prodr.* xi. 193; leaves petioled elliptic acuminate nearly glabrous upper sessile cordate, spikes lax 1-sided, flowers solitary or paired, many of the lower bracts large leaf-like, sepals linear subobtuse glabrous in fruit elongate somewhat hairy at the tips, corolla  $1\frac{1}{4}$  in. blue. *T. Anders. in Journ. Linn. Soc.* ix. 477. *Ruellia alata*, *Wall. Pl. As. Rar.* i. 26, t. 31, and *Cat.* 2371 a. *Goldfussia Thomsoni*, *Bot. Mag.* t. 5119, not *Strobilanthes Thomsoni*, *T. Anders.*

SUBALPINE HIMALAYA, alt. 7–11,000 ft.; from Nepal to Bhotan, common, *Wallich, &c.*

*Stems* 6–24 in., weak, quadrangular sometimes sharply, glabrous or pubescent on the angles. *Leaves* 3 by 1 in., crenate-serrate, puberulous or glabrate, thinly lineolate above; nerves 6 pair; petiole  $\frac{3}{4}$  in. *Spikes* 1–6 in., often flexuose or zigzag, lowest flowers appearing often axillary solitary opposite; bracts (many of the middle ones) ovate or subcordate, altogether resembling the upper leaves; uppermost bracts often small, less than  $\frac{1}{4}$  in., ovate or obovate, glabrate; bracteoles linear-oblong, small or 0. *Sepals* in flower  $\frac{1}{2}$  in., usually quite glabrous, in fruit often more than 1 in., laxly flexuose, very narrow, usually more or less glandular hairy at least at the tips. *Corolla* nearly straight, glabrous or with minute lines of hairs within; cylindric base about as long as the ventricose portion; segments short, round. *Filaments* and *style* glabrous. *Capsule*  $\frac{1}{2}$ – $\frac{2}{3}$  in., glabrous, 4-seeded. *Seeds*  $\frac{1}{8}$  in., ovate, pubescent; areoles small.—The lowest flowers often appear axillary opposite, with 2 small ovate bracteoles each: more careful comparison shows that the axillary flower is on a



short axillary branch which has 2 opposite bracts, 1 barren, the other with a flower often supported by the two normal but minute bracteoles.

VAR. *microphylla*, Nees; leaves very thin herbaceous uppermost cuneate or rhomboid at the base, bracts lanceolate or subovate many foliaceous not cordate, sepals in fruit much broader than in *S. Wallichii* type, corolla-mouth much on one side, capsule more than  $\frac{3}{4}$  in., seeds  $\frac{1}{2}$  in. *Ruellia alata*, Wall. Cat. 2371 b.—N.W. Himalaya, alt. 7–11,000 ft.; from Kashmir to Kumaon, common, Wallich, &c.—Connected by intermediate forms with the Sikkim type. Leaves often large, sometimes small.

132. **S. atropurpureus**, Nees in Wall. Pl. As. Rar. iii. 86, and in DC. Prodr. xi. 195; leaves ovate acute coarsely serrate sparsely hairy, spikes lax, flowers solitary or paired, many of the lower bracts leaf-like, sepals linear subobtusely patent hairy, corolla  $1\frac{3}{4}$  in. blue. T. Anders. in Journ. Linn. Soc. ix. 477. *Ruellia atropurpurea*, Wall. Cat. 2398.

SUBALPINE W. HIMALAYA, alt. 6–10,000 ft.; from Jamu to Nepal, frequent, Wallich, &c.

A perennial, often growing in swamps; stems 1–1½ foot, thick, succulent, hirsute upwards, or dwarfed 3–6 in. Lower leaves petioled or the petiole winged to the base. Corolla usually much curved, the ventricose part of the tube very broad. Otherwise as *S. Wallichii* var. *microphylla*, of which this species has been treated (perhaps correctly) at Kew as a var.

133. **S. subnudatus**, Clarke; leaves petioled elliptic acuminate at both ends nearly glabrous uppermost sessile cordate, spikes linear hairy interrupted, nearly all the bracts small oblong, sepals linear elongated sub-obtusely hairy, corolla  $1\frac{1}{2}$  in. purple.—*Goldfussia* sp. n. 29, Herb. Ind. Or. H. f. & T.

SUBALPINE SIKKIM; Lachoong, alt. 9000 ft., J. D. H.

Stems 1 foot, from a woody rootstock, slender, nearly glabrous. Leaves  $1\frac{1}{2}$  by  $\frac{1}{2}$  in., crenate, with minute scattered bristly hairs above and on the nerves beneath, raphides obsolete; petiole  $\frac{1}{6}$  in., one or two pairs of the leaves at the base of the spikes sessile cordate. Spikes 1–4 in.; flowers mostly subsolitary, occasionally opposite; bracts  $\frac{1}{4}$  in., oblong or elliptic (none of the flowers with large bracts similar to the uppermost sessile cordate leaves as in *S. Wallichii*); bracteoles similar to the bracts. Sepals in fruit  $\frac{1}{2}$ – $\frac{3}{4}$  in., as of *S. Wallichii*.—This has been taken as a form of *S. Wallichii*; but none of the numerous forms of *S. Wallichii* have bracts and hairy spikes without foliaceous bracts like it.

134. **S. urophyllus**, Nees in DC. Prodr. xi. 192; leaves lanceolate acuminate at both ends glabrous, flowers scattered, lower bracts leaf-like upper small long-petioled ovate, corolla  $\frac{1}{2}$  in. curved pubescent without. T. Anders. in Journ. Linn. Soc. ix. 477. *Ruellia urophylla*, Wall. Cat. 2344. *Dipteracanthus urophyllus*, Nees in Wall. Pl. As. Rar. iii. 82.

KHASIA MTS.; Wallich. JAINTEA, alt. 4000 ft.; Jarain, Clarke.

A small, ramous, nearly glabrous shrub. Leaves  $5\frac{1}{2}$  by  $1\frac{1}{2}$  in., those on the flowering branches much reduced, serrate, not (or very obscurely) lineolate; nerves 9 pair; petiole  $1\frac{1}{4}$  in. Flowers scattered, alternate and subopposite on small-leaved branches; bracts  $\frac{1}{2}$  in. exclusive of their  $\frac{1}{4}$  in. petioles, nearly glabrous, persistent; bracteoles similar. Calyx  $\frac{1}{4}$ – $\frac{1}{2}$  in., divided nearly to the base, pubescent; segments linear, enlarged more hairy in fruit. Capsule  $\frac{1}{3}$ – $\frac{1}{2}$  in., 4-seeded. Seeds  $\frac{1}{8}$  in., ovate, pubescent; areoles very small.

VAR. *sikkimensis*; leaves much broader, corolla 1 in. much curved purple-blue.—Darjeeling; Griffith (Kew Distrib. n. 6125); alt. 6000 ft., Treutler.—Leaves  $5\frac{1}{2}$  by  $2\frac{1}{4}$  in. “Flowers faintly fragrant” (Treutler).

135. **S. stenophyllus**, Clarke; leaves narrowly lanceolate attenuate



at both ends ciliolate pubescent, flowers alternate or opposite in leafy spikes, upper bracts ovate or spathulate persistent, corolla 1 in. nearly glabrous purple.

KHASIA MTS., alt. 3-5000 ft., frequent; *J. D. H.*, &c.

A small, erect, somewhat densely branched shrub. *Leaves*  $2\frac{1}{4}$  by  $\frac{1}{3}$  in., equal or subequal, minutely dentate undulate or subentire; nerves 5-6 pair, puberulous, beneath ciliate; petiole obscure. *Spikes* 1-3 in., numerous, axillary and terminal, nearly glabrous; lower bracts leaf-like; upper sometimes spathulate (hardly petioled as in *S. urophyllus*); bracteoles  $\frac{1}{16}$  in., ovate. *Sepals*  $\frac{1}{3}$ - $\frac{1}{2}$  in., subequal, linear, obtuse. *Corolla* nearly straight, hairy within; cylindric base shorter than the ventricose portion; segments short, round. *Filaments* very hairy downwards. *Ovary* glabrous; style sparsely hairy. *Capsule*  $\frac{2}{3}$  in., 4-seeded. *Seeds*  $\frac{1}{8}$ - $\frac{1}{6}$  in., ovate, pubescent; areoles hardly any.—This common Khasia in habit and leaves remarkably resembles *S. isophyllus*; the inflorescence, sepals, &c., are totally different.

136. **S. Panichanga**, *T. Anders. in Journ. Linn. Soc.* ix. 478; leaves broadly elliptic acuminate at both ends rusty-pubescent, panicles lax capillary pubescent, flowers scattered mostly alternate, bracts minute persistent, corolla  $1\frac{1}{2}$  in. nearly glabrous. *Ruellia Panichanga*, *Wall. Cat.* 2387. *Asystasia Panichanga*, *Nees in Wall. Pl. As. Rar.* iii. 90, and in *DC. Prodr.* xi. 167.

SILHET; *Wallich*. CACHAR; *Keenan*.

A shrub; branches tetragonous, pubescent upwards. *Leaves*  $6\frac{1}{2}$  by  $2\frac{3}{4}$  in., serrate; nerves 10 pair; petiole  $\frac{3}{4}$  in. *Peduncles*  $\frac{1}{2}$ -2 in., repeatedly trichotomous; bracts and bracteoles scarcely  $\frac{1}{8}$  in., linear, pubescent. *Calyx*  $\frac{1}{4}$  in., deeply subequally 5-fid, closely uniformly pubescent; segments linear-lanceolate. *Corolla* nearly straight, puberulous, cylindric base longer than the calyx, gradually widening into the rather narrow cylindric portion of the tube; segments round, short, contorted in bud. *Filaments* and *style* with scattered white hairs. *Capsule* more than  $\frac{1}{2}$  in.

137. **S. coloratus**, *T. Anders. in Journ. Linn. Soc.* ix. 481, not of *Nees*; leaves ovate or elliptic acuminate glabrous, panicles capillary very compound glabrous, bracts elliptic caducous, corolla  $1\frac{1}{2}$  in. nearly glabrous pale purple. *Ruellia colorata*, *Wall. Cat.* 2388. *Goldfussia colorata*, *Nees in Wall. Pl. As. Rar.* iii. 89, and in *DC. Prodr.* xi. 176.—*Acanthacea*, *Griff. Itin. Notes*, 87, n. 1280.

EASTERN HIMALAYA; Sikkim and Bhotan, alt. 2-5000 ft., *Clarke*. ASSAM and KHASIA MTS., alt. 2-4000 ft., frequent; *Griffith*, *H. f. & T.*, &c.

A nearly glabrous shrub, 3-6 ft. *Leaves* 7 by  $2\frac{1}{2}$ -4 in., serrate; nerves 7-8 pair; petiole  $\frac{1}{4}$ - $1\frac{1}{2}$  in. *Panicle* often 1 foot in diam., leafless bractless with 200-500 flowers, sometimes denser with stouter shorter branches; bracts  $\frac{1}{3}$  in. *Calyx*  $\frac{1}{4}$ - $\frac{1}{3}$  in., deeply 5-fid; segments subequal, lanceolate, glabrous. *Corolla* tubular-ventricose, glabrous. *Capsule*  $\frac{1}{3}$ - $\frac{1}{2}$  in., 4-seeded. *Seeds*  $\frac{1}{8}$ - $\frac{1}{6}$  in., ovate, pubescent; areoles hardly any.—The flowers said by *Nees* to be capitate are mostly alternate scattered; they are capitate only at the tips of the younger panicle-branches.

VAR. *crinita*; panicle-branches minutely thinly glandular-hairy. *S. crinitus*, *T. Anders. in Journ. Linn. Soc.* ix. 481. *Goldfussia crinita*, *Nees in DC. Prodr.* xi. 176.—Bhotan, alt. 1000 ft.; *Griffith*. Assam.—Varies in the thinness of the panicle-branches just as does the type.

Series D. *Paniculatae*. *Flowers* paniced laxly, or densely, secund, subspicate. *Bracts* conspicuous, persistent. *Capsule* elliptic, compressed, cuneate at both ends. *Seeds* shaggy, often only 2 perfected, or if 4 imbricated.—Species of Ceylon or S. Deccan Peninsula. (This series approaches in technical character, though not in habit, the section \*\*\* of the series A, *Bracteatae*. Compare *S. perfoliatus* above, which *Wight* placed here.)



138. **S. sexennis**, *Nees in DC. Prodr.* xi. 187; leaves sessile elliptic attenuate at each end denticulate nearly glabrous, bracts sessile ovate base rounded or subcordate glandular-hairy or glabrate, corolla  $1\frac{1}{4}$  in. glabrous. *T. Anders. in Journ. Linn. Soc.* ix. 483. *S. interruptus*, *Benth. in Pl. Hohenack.* n. 1432.

CEYLON; *Walker, Thwaites*, C. P. n. 2593. NILGHERY MTS.; on Dodabetta, *Hohenacker*.

A shrub, flowering at 6 or 7 years old, then dying down. *Branches* subquadrangular, glabrous, transversely verrucose. *Leaves* 3 by 1 in.; nerves 5–6 pair; petiole winged, base dilated. *Bracts*  $\frac{1}{2}$  by  $\frac{1}{4}$ – $\frac{1}{3}$  in., glabrous or hairy on the same spike; bracteoles  $\frac{1}{2}$  in., oblong obtuse. *Calyx* divided subequally nearly to the base; segments linear-oblong, hairy at least at the tips. *Corolla* white (*Beddome*). *Capsule*  $\frac{1}{2}$  in., glabrous, 2-seeded.—Described from Nees' type specimen; the specimen in leaf only which he adds has very large many-nerved leaves very woolly when young, and is a gregarious undershrub well known to Col. Beddome in Ceylon, of which the flower has not yet been observed.

*VAR. arguta*; leaves distinctly dentate sometimes slightly hairy, petiole (even in the leaves near the spikes) usually well defined sometimes 1–2 in. not dilated at the base, spikes often elongate secund sometimes dense. *S. argutus*, *Nees in DC. Prodr.* xi. 188.—Ceylon, frequent; *Gardner, Thwaites*, C. P. 66 partly, &c.—Appears a trifling variety.

*VAR. cerinthoides*; leaves sessile elliptic or oblong narrowed suddenly at the very base subentire coriaceous few-nerved. *S. cerinthoides*, *Nees in DC. Prodr.* xi. 724; *T. Anders. in Thwaites Enum.* 229. *Mackenzia sessilis*, *Nees in DC. Prodr.* xi. 308.—Ceylon; *Thwaites* (C. P. nn. 2594, 66 partly), *Mackenzie*, &c.—The type of this with nearly all the leaves subsessile rounded at the base seems to form a distinct species, but there are examples wherein the lower leaves are cuneate at the base. The flowers are noted white with much purple marking.

*VAR. hirsutissima*; stem and leaves hirsute. *S. hirsutissimus*, *Nees in DC. Prodr.* xi. 187.—Ceylon; *Walker, Thwaites* (C. P. n. 3626), &c.

139. **S. homotropus**, *Nees in DC. Prodr.* xi. 187; leaves oblong or elliptic long attenuate at the base glabrous, spikes very hairy flexuose or somewhat twisted, bracts elliptic or subovate narrowed at the base, corolla 1 in. nearly glabrous. *S. sexennis*, *Bedd. Ic. Pl. Ind. Or.* t. 206, not of *Nees*.

NILGHERY MTS., alt. 8000 ft.; *Wight*, &c.

This has been treated as a var. of *S. sexennis*, but the bracts are quite unlike.

140. **S. violaceus**, *Bedd. Ic. Pl. Ind. Or.* t. 205; leaves large petioled ovate hairy on both surfaces, bracts elliptic or oblong much shorter than the calyx, corolla  $1\frac{1}{4}$  in. glabrous without deep violet.

NILGHERY MTS.; Sisparah, alt. 6000 ft., *Beddome*.

A large shrub, very rarely flowering (*Beddome*); branches quadrangular, hairy upwards. *Leaves*  $6\frac{1}{2}$  by  $3\frac{3}{4}$  in., shortly acuminate at both ends, crenulate; nerves 14 pair; petiole 1–2 in. *Panicles* 6–10 in., lax, hairy; bracts  $\frac{1}{6}$  in.; bracteoles  $\frac{1}{2}$  in., oblong hairy. *Calyx* divided nearly to the base, less hairy than the bracteoles; segments  $\frac{1}{4}$  in., narrowly oblong, obtuse. *Corolla* nearly straight, urceolate, very hairy within; constricted base short; segments short, rounded. *Capsule* not seen.

141. **S. gracilis**, *Bedd. in Trans. Linn. Soc.* xxv. 222, and *Ic. Pl. Ind. Or.* t. 207, not of *T. Anders.*; leaves sessile lanceolate attenuate at both ends glabrous, panicle glabrous, bracts oblong much shorter than the calyx, bracteoles 0, corolla 1 in. white lilac tinged. *S. Beddomei*, *T. Anders. in Journ. Linn. Soc.* ix. 482.

ANAMALLAY MTS., alt. 5–6000 ft.; *Beddome*.



A very large shrub (Beddome), glabrous or the sepal-tips thinly glandular-hairy; branches terete. *Leaves* 7 by  $2\frac{1}{4}$  in., serrulate; nerves 10 pair. *Panicle* lax, branches long curved, flowers distant; bracts in opposite pairs,  $\frac{1}{6}$ – $\frac{1}{4}$  in., sometimes both, more often one only, carrying a flower on a pedicel  $0$ – $\frac{1}{10}$  in. *Sepals*  $\frac{1}{4}$ – $\frac{1}{3}$  in., linear-ligulate. *Corolla* slightly curved, nearly glabrous, constricted part of the tube short (from Beddome). *Filaments* and *style* hairy (Beddome). *Capsule*  $\frac{1}{2}$  in., glabrous.

142. **S. helicoides**, *T. Anders. in Thwaites Enum.* 229, and in *Journ. Linn. Soc.* ix. 483; leaves elliptic or obovate acuminate glabrous, panicle very compound capillary divaricate glabrous, flowers scattered mostly in appearance pedicelled, bracts much smaller than the calyx, corolla 1 in. glabrous without violet. *Bedd. Ic. Pl. Ind. Or.* t. 220. *Leptacanthus helicoides*, *Nees in DC. Prodr.* xi. 170.

CEYLON, up to 3000 ft. alt.; *Walker, Thwaites*.

A shrub, 2–3 ft., glabrous except the sepal-tips. *Leaves* 4 by  $1\frac{1}{2}$  in. (lower larger), base cuneate rounded (or the upper cordate), toothed, paler beneath; nerves 5–6 pair; petiole  $0$ – $\frac{1}{3}$  in. *Panicle* 6–12 in. diam., dense with slender divaricate recurved or zigzag branches; bracts at the forks  $\frac{1}{8}$ – $\frac{1}{2}$  in., ovate; bracts below the flowers  $\frac{1}{12}$ – $\frac{1}{6}$  in., linear or linear-obovate. *Sepals*  $\frac{1}{4}$  in., linear, glabrous or sparsely glandular-hairy at the tips. *Corolla* nearly straight, ventricose, constricted base very short; segments short, rounded. *Capsule*  $\frac{1}{3}$  in., glabrous, 2-seeded (4-seeded, *Nees*).—The flowers are in appearance solitary terminal on pedicels  $\frac{1}{4}$ – $\frac{1}{2}$  in., with 2 bracts (called bracteoles by Beddome) placed  $0$ – $\frac{1}{20}$  in. below the flower.

143. **S. rubicundus**, *T. Anders. in Journ. Linn. Soc.* ix. 483 (not of *Thwaites Enum.* 229); leaves lanceolate acuminate at both ends nearly glabrous, panicle compound slender glandular-pubescent, bracts at the forks ovate acuminate, flower-bracts 0, corolla  $\frac{3}{4}$  in. pubescent without violet. *S. paniculatus*, *Bedd. Ic. Pl. Ind. Or.* t. 199, not of *T. Anders.* *Ruellia rubicunda*, *Heyne in Herb. Rottler; Wall. Cat.* 2337. *Leptacanthus rubicundus*, *Nees in Wall. Pl. As. Rar.* iii. 90, and in *DC. Prodr.* xi. 170.

S. DECCAN PENINSULA; Wynaad and Coorg, alt. 2–3000 ft., *Rottler, Beddome*.

A rather delicate shrub, 5–6 ft.; branches cylindric, glabrous. *Leaves* 5 by  $1\frac{1}{4}$  in., unilate crenate or subentire; nerves 6–7 pair, glabrous or pubescent beneath; petiole  $\frac{1}{3}$  in. *Panicle* 8 in., narrow; bracts at the forks  $\frac{1}{6}$ – $\frac{1}{2}$  in., lanceolate from an ovate base; pedicels  $\frac{1}{6}$ – $\frac{1}{2}$  in., mostly ebracteolate except at the base. *Calyx*  $\frac{1}{4}$ – $\frac{1}{3}$  in., divided deeply, closely pubescent; segments lanceolate-subulate, often very unequal. *Corolla* nearly straight; base funnel-shaped, hardly cylindric. *Capsule* not seen.

144. **S. paniculatus**, *T. Anders. in Journ. Linn. Soc.* ix. 483, not of *Bedd.*; leaves lanceolate acuminate at both ends nearly glabrous, panicle compound slender glandular-pubescent, bracts at the forks linear or linear-oblong, pedicels very short, flower-bracts 0, corolla nearly 1 in. glabrous without. *S. rubicundus*, *T. Anders. in Thwaites Enum.* 229, not of *Journ. Linn. Soc.* ix. 483.

CEYLON; *Thwaites* (C. P. n. 3351).

*Pedicels*  $0$ – $\frac{1}{10}$  in. *Calyx*  $\frac{1}{8}$ – $\frac{1}{4}$  in., glandular-hairy. Otherwise as *S. rubicundus*; the leaves are in the examples a good deal longer.

145. **S. pulcherrimus**, *T. Anders. in Thwaites Enum.* 229, excl. syn., and in *Journ. Linn. Soc.* ix. 483, the Ceylon plant only; leaves elliptic acuminate at both ends hairy on the nerves beneath, panicle large very compound viscous hairy, bracts at its divisions ovate acute, flower-bracts obsolete, corolla 1 in. puberulous without violet, capsule hairy. *Leptacanthus Walkeri*, *Nees in DC. Prodr.* xi. 170, not of *Wight*.



CEYLON, alt. 4-7000 ft.; *Walker, Thwaites* (C. P. nn. 266, 301).

A large, rambling shrub (*Walker*); branches terete, glabrous. *Leaves*  $6\frac{1}{2}$  by  $2\frac{1}{4}$  in., minutely toothed; nerves 9 pair; petiole  $1\frac{1}{2}$  in. *Panicle* 8-14 in.; branches ascending, bracts  $\frac{1}{6}$ - $\frac{1}{2}$  in., sessile, base rounded or cordate; pedicels  $\frac{1}{6}$ - $\frac{1}{3}$  in., mostly ebracteolate except at the base. *Calyx*  $\frac{1}{3}$ - $\frac{1}{2}$  in., divided nearly to the base, viscous-hairy; segments linear caudate. *Corolla* nearly straight; tube broad-cylindric from the base, very hairy within; segments short, round. *Capsule*  $\frac{2}{3}$  in., 4-seeded.

146. **S. amabilis**, *Clarke*; leaves broadly elliptic acuminate at both ends glabrous, panicle large compound viscous hairy, bracts at its divisions linear-oblong, flower-bracts linear much shorter than the calyx, corolla  $1\frac{1}{4}$ - $1\frac{1}{2}$  in. glabrous without purplish, capsule glabrous. *Leptacanthus Walkeri*, *Wight Ic.* t. 1507, *not of Nees, nor Strobilanthes Walkeri, Nees*.

NILGHERY MTS., alt. 6000 ft.; *Gardner, &c., Hohenacker*, n. 1440.

*Leaves*  $7\frac{1}{2}$  by  $3\frac{1}{4}$  in., glabrous beneath; nerves 10-12 pair. *Calyx*  $\frac{1}{3}$ - $\frac{2}{3}$  in., closely subtended by 2 linear bracts. *Capsule*  $\frac{3}{4}$  in. and upwards, conspicuously stipitate.—Closely allied to *S. pulcherrimus*, which it was taken for by *Wight*. *T. Anderson* overlooked the numerous points of difference above diagnosed, which are constant. A much finer species than the Ceylon one, the panicle stouter with fewer but larger flowers.

#### SPECIES NOT SEEN.

147. **S. NEESII**, *Kurz in Journ. As. Soc.* 1873, pt. ii. 93, and *For. Fl.* ii. 245; leaves large lanceolate minutely hairy on both surfaces, spikes sessile dense bracteate ultimately elongated interrupted below, bracts proper oblong-linear shorter than the calyx slightly serrate at the tips, corolla  $1\frac{1}{4}$ - $1\frac{1}{2}$  in. glabrous without purple.

MARTABAN; *Kurz*.

A large shrub, 10-12 ft. *Leaves* attaining 10 in., shortly acuminate, base attenuate, obsoletely repand-toothed; petiole  $\frac{1}{2}$ - $1\frac{1}{2}$  in. Lowest bracts (or floral leaves) leaf-like, caducous,  $\frac{1}{2}$  in., tips serrate; bracteoles 2, linear-lanceolate, glandular-hirsute, as long as the calyx. *Calyx-segments*  $\frac{3}{5}$  in. or more, linear, hoary, ciliate. *Corolla-tube* long, slender, hairy within. *Stamens* 2 only; filaments glabrous. *Style* hairy. *Capsule* a little longer than the calyx, glabrous, tip pubescent, 4-seeded. *Seeds* silky.

148. **S. REMOTUS**, *T. Anders. in Journ. Linn. Soc.* ix. 471; leaves ovate acuminate subentire glabrous, spikes axillary 1 or 2 together elongate, flowers remote solitary, bracteoles and calyx-segments smaller than the bracts, capsule elongate glabrous.

TENASSERIM; *Helper*.

*Stem* subterete, glabrous. *Spikes*  $1\frac{1}{2}$ -3 in.; bracts  $\frac{1}{3}$  in., lanceolate, mucronate, 1-nerved, glabrous; bracteoles and calyx-segments  $\frac{1}{2}$  in., narrower than the bracts. *Capsule*  $\frac{4}{5}$  in.—Allied to *S. fimbriatus* and *S. polythrix*.

149. **S. HAPLANTHOIDES**, *T. Anders. in Journ. Linn. Soc.* ix. 471; leaves petioled ovate acuminate at both ends crenate or undulate glabrous or floral leaves ciliate, spikes suberect lax, bracts bracteoles and calyx-segments linear hirsute with hyaline bristles, corolla funnel-shaped pubescent without hairy within.

BRITISH BURMA; Moulmein, *Falconer* (n. 402 in *Herb. Calcutt.*), *Helper*, n. 255.

An erect herb, 1- $1\frac{1}{2}$  foot. *Stem* terete, swollen at the nodes, glabrous. *Leaves* 2- $3\frac{1}{2}$  by 1- $1\frac{1}{2}$  in., paler beneath; petiole  $\frac{4}{5}$  in. *Spikes* 2-3 in., lax, crowded in the upper axils and subterminal, on slender hirsute peduncles; bracts  $\frac{1}{2}$  in.; bracteoles and calyx  $\frac{1}{4}$  in. *Corolla*  $\frac{4}{5}$  in., tube suddenly narrowed, segments small. *Capsule*  $\frac{1}{2}$  in., constricted at the base, upwards ovate, acute, glabrous.—Placed by *T. Anderson* next *S. khasyanus*.

150. **S. MASTERSI**, *T. Anders. in Journ. Linn. Soc.* ix. 481; upper leaves sessile lanceolate acute serrate subglabrous, panicles dichotomous lax erect viscous, pedicels elongate mostly 1-fld., bracts lanceolate acute sparsely glandular deciduous, corolla funnel-shaped suberect glabrous.



ASSAM; *Masters, Simons.*

*Stem* erect, tetragonous, glandular, viscous. *Calyx-segments* equal, linear, glandular, viscous. *Stamens* included. *Capsule* oblanceolate, elongate, tip glandular, 4-seeded.—Placed by Anderson next *S. coloratus*.

151. *S. SPICATUS*, *T. Anders. in Journ. Linn. Soc.* ix. 484; leaves subsessile ovate or ovate-lanceolate acute base subcordate serrate tomentose above pale pubescent beneath, spikes terminal elongate, flowers solitary sessile opposite, bracts leaf-like ovate pubescent, bracteoles small herbaceous spatulate, corolla  $1\frac{1}{2}$  in. funnel-shaped glabrous.

KHASIA MTS. ; above Nunklow, *Simons.*

Softly pubescent; stem tetragonous. *Leaves* 1–3 by  $\frac{1}{4}$ –1 in., floral passing into bracts. *Bracts*  $\frac{1}{3}$ – $\frac{2}{3}$  in.; bracteoles  $\frac{1}{4}$  in. *Calyx*  $\frac{1}{2}$  in.; segments linear, unequal. *Capsule* oblanceolate, glandular at the tip, 4-seeded. *Seeds* large.—Affinity uncertain, *T. Anderson.*

152. *S. LAMIOIDES*, *T. Anders. in Journ. Linn. Soc.* ix. 485; floral leaves large sessile ovate acuminate serrate tomentose beneath, heads terminal few-fld., bracts spatulate glandular-tomentose ciliate, corolla straight tomentose without and within. *Kurz For. Fl.* ii. 244.

PEGU; Mt. Taijoo, alt. 4000 ft., *Brandis*; Mts. Nattoung, *Cross.* MARTABAN HILLS, alt. 2–4000 ft.; *Kurz.*

An evergreen shrub (*Kurz*), glandular-tomentose; stem subtetragonous. *Floral leaves* 3–1 by 2–1 in., glabrous above. *Heads* leafy, lax, sessile or shortly peduncled; bracteoles linear, acute, subglabrous. *Calyx* 5-cleft to the middle; lobes linear, acute. *Corolla*  $\frac{4}{5}$  in., like that of *Ruellia*. *Stamens* included. *Capsule*  $\frac{1}{2}$  in., compressed, tip bearded. *Seeds* large.—Of doubtful affinity (*T. Anderson*). Corolla blueish-purple, seeds shortly tomentose (*Kurz*).

153. *S. VIOLÆFOLIUS*, *T. Anders. in Journ. Linn. Soc.* ix. 485; leaves petioled obliquely ovate acute serrate subglabrous, spikes few-fld., flowers distant subsessile in opposite pairs, bracts linear, corolla funnel-shaped straight glabrous without and within.

SIKKIM HIMALAYA, alt. 5000 ft.; Ratong Valley, *T. Anderson.*

*Stem* herbaceous, weak; innovations pubescent. Lower *leaves* round; petiole 1 in., filiform; upper leaves sessile,  $1\frac{1}{2}$ – $3\frac{1}{2}$  by 1– $1\frac{1}{2}$  in. *Spikes* 3–4 in., terminal on lateral branches; bracts  $\frac{1}{5}$ – $\frac{1}{4}$  in., linear sometimes spatulate, herbaceous; bracteoles  $\frac{1}{10}$  in., subulate. *Calyx* deeply divided; segments  $\frac{1}{2}$  in., linear, acute, glabrous. *Corolla*  $\frac{4}{5}$  in., pale blue; lobes equal, small.—Of doubtful affinity (*T. Anderson*).

154. *S. ? LANATUS*, *Nees in DC. Prodr.* xi. 191; leaves ovate acuminate entire glabrate above woolly-tomentose beneath, spikes axillary and terminal ternate cylindric dense, bracts oblong obtusely cuspidate woolly-tomentose beneath glabrous lanceolate above.

NILGHERRIES; *Perrottet.*

Very distinct from the stem, petioles under surface of leaves and spikes being densely softly tomentose. *Corolla-tube* 1 in., slender, throat campanulate, approaching that of *Stenosiphonium*. *Calyx* sub-5-partite; segments linear, obtuse, very villous.—Genus doubtful: referred to *Strobilanthes* from its similarity to *S. Mysurensis*, *Nees*, which is an *Asystasia*.

*S. VERRUCULOSUS*, *Nees in DC. Prodr.* xi. 181, from “India” remains obscure; *Nees* doubts whether it may not have been a *Ruellia*.

## XIX. CALACANTHUS, *T. Anders.*

A shrub. *Leaves* large, entire. *Spikes* terminal, dense or elongate, hairy; bracts prominent, elliptic; flowers large, purple. *Calyx* sub-5-partite, segments unequal. *Corolla* deeply 2-lipped; posterior lip narrow, shortly 2-fid, anterior of 3 short emarginate lobes; lobes all contorted in bud. *Stamens* 4, didynamous; anthers subequal, oblong, 2-celled, muticous. *Ovary* 4-ovulate; style long, stigma simple linear. *Capsule* ellipsoid,



compressed, acute at both ends, 2-seeded. *Seeds* compressed, exareolate, densely shortly hairy.

**C. Dalzelliana**, *T. Anders.*; *Benth. in Gen. Pl.* ii. 1088. *Lepidagathis grandiflora*, *Dalz. in Hook. Kew Journ.* ii. 138; *Dalz. & Gibs. Bomb. Fl.* 190; *Bedd. Ic. Pl. Ind. Or.* t. 226.

SYHADREE MTS.; near Bombay, *Dalzell*. CANARA; near the foot of the Ghats, plentiful, *Beddome*; Purwhur Ghat, *Ritchie*.

*Leaves* 7 by  $3\frac{1}{4}$  in., acuminate at both ends, very sparsely hairy above, glabrous beneath, minutely lineolate on both surfaces; nerves 11 pair; petiole 0–1 in. *Spikes* 1–6 in., sometimes interrupted towards the base; bracts  $\frac{2}{3}$  in.; bracteoles  $\frac{1}{3}$ – $\frac{1}{2}$  in., oblong. *Calyx*  $\frac{1}{2}$  in., hairy; one segment elliptic, two narrowly oblong, two linear-lanceolate. *Corolla*  $1\frac{1}{2}$ –2 in.; cylindric base shorter than the lobes; palate bullate, yellow-hairy. *Filaments* glabrous; anther-cells hairy. *Ovary* glabrous; style hairy. *Capsule*  $\frac{3}{4}$  by  $\frac{1}{3}$  in. *Seeds* nearly  $\frac{1}{3}$  in. diam.

## XX. BLEPHARIS, *Juss.*

Herbs or undershrubs, harsh often rigid or prickly. *Leaves* opposite or 4 in a whorl, subentire toothed or prickly. *Spikes* terminal or on suppressed axillary branches, strobiliform, 4-ranked or capitate and few-fld., or many-bracteate and 1-fld., bracteate and bracteolate. *Sepals* 4, unequal, in opposite pairs, inner smaller; one of the outer pair emarginate or 2-lobed. *Corolla-tube* ovoid, horny; limb of 2 lips, upper subobsolete; lower patent, 3-lobed, blue or pinkish. *Stamens* 4, didynamous; filaments thick, rigid, anterior produced above the insertion of the anthers; anthers 1-celled, margins densely bearded, second cell small or 0. *Ovary* glabrous, 4- or 2-ovulate; style linear, very shortly 2-fld. *Capsule* oblong or ellipsoid, 2- or 4-celled. *Seeds* compressed, orbicular, echinate by thick papillæ formed of closely connected tubes spirally or annularly thickened, which when moistened usually become free at their upper ends (see *Kippist in Trans. Linn. Soc.* xix. t. 6, fig. 5).—Species 20, Indian and African.

1. **B. asperrima**, *Nees in DC. Prodr.* xi. 267; leaves ovate subentire setulose, bracteoles obovate 3-toothed subglabrous green-nerved, capsule 4-seeded. *Dalz. & Gibs. Bomb. Fl.* 192; *Wight Ic.* t. 1534; *T. Anders. in Journ. Linn. Soc.* ix. 499.

W. DECCAN PENINSULA; Concan and Canara, on the Ghauts common, *Dalzell*, &c.

*Stems* 8–24 in., herbaceous, erect, glabrous or sparsely setulose. *Leaves*  $2\frac{1}{2}$  by  $1\frac{1}{4}$  in., base rounded or obtuse; petiole  $\frac{1}{3}$  in. *Heads* terminal and quasi-axillary, few-fld.; outermost bracts leafy; proper bracts  $\frac{1}{3}$  in. or small, obovate or subpetioled, ovate; bracteoles  $\frac{1}{3}$ – $\frac{1}{2}$  in., usually with 3 lanceolate subspinescent teeth, the middle the shortest. *Calyx* green-and-white nerved, glabrous thinly ciliate or setulose; 2 outer segments  $\frac{2}{3}$ –1 in., spathulate, one bilobed; 2 inner much smaller, lanceolate. *Corolla*  $\frac{3}{4}$ –1 in., blue. *Capsule*  $\frac{1}{2}$  in., oblong, seed-bearing from the base. *Seeds*  $\frac{1}{8}$ – $\frac{1}{6}$  in., compressed, ovate, closely echinate; spines obtuse, lanceolate, many closely connected tubes containing spiral filaments, which rise elastically when moistened, but do not separate.

2. **B. boerhaaviæfolia**, *Pers. Syn.* ii. 180; leaves usually 4 in a whorl elliptic repand-toothed puberulous or glabrate, bracteoles spathulate bristle-ciliate subglabrous green-nerved, capsule 2-seeded. *Wall. Cat.* 2513; *Nees in Wall. Pl. As. Rar.* iii. 97, and in *DC. Prodr.* xi. 266; *Wight Ill.* t. 164 b, fig. 6, and *Ic.* t. 458; *Dalz. & Gibs. Bomb. Fl.* 192; *T. Anders. in*



*Journ. Linn. Soc.* ix. 500. *B. maderaspatensis*, *Roth Nov. Sp.* 320. *Acanthus maderaspatensis*, *Linn. Sp. Pl.* 892; *Roxb. Fl. Ind.* iii. 33. *A. ciliaris*, *Burm. Fl. Ind.* 139, t. 42, fig. 2.

DECCAN PENINSULA, from Mt. Aboo and Behar to Ceylon; common. PEGU; *Wallich, &c.*—DISTRIB. Ava, Tropical Africa.

Prostrate, scabrous or puberulous. *Leaves*  $1\frac{3}{4}$  by  $\frac{3}{4}$  in., acute at both ends; petiole  $\frac{1}{8}$  in. *Spikes* axillary or peduncled, 1- or few-fl'd.; bracts  $\frac{1}{3}$  in., ovate, bristle-ciliate; bracteoles  $\frac{1}{3}$ – $\frac{1}{2}$  in. *Calyx*  $\frac{1}{3}$ – $\frac{1}{2}$  in.; segments 4, oblong, unequal, nerved, subglabrous, one of the outer pair minutely emarginate. *Corolla*  $\frac{2}{3}$  in., pink, purple or nearly white. *Capsule*  $\frac{1}{4}$ – $\frac{1}{3}$  in., ellipsoid, compressed, shining glabrous. *Seeds* densely covered with obtuse spines formed of tubes free at the vertex when moistened.—Wight depicts the ovary 2-ovulate, and no more can be found; nor does the capsule show (as 2-seeded capsules usually do) the papillæ of the suppressed ovules; but Nees and Benth. in *Gen. Pl.* say the ovary is always 4-ovulate.

3. ***B. molluginifolia***, *Pers. Syn.* ii. 180; leaves usually 4 in a whorl oblong hairy or minutely scabrous, heads mostly 1-fl'd. many of the outer bracts barren, bracteoles elliptic or oblong subsessile, capsule 2-seeded. *Wall. Cat.* 2514; *Nees in Wall. Pl. As. Rar.* iii. 97, and in *DC. Prodr.* xi. 266; *Dalz. & Gibs. Bomb. Fl.* 192; *T. Anders. in Journ. Linn. Soc.* ix. 500. *B. repens*, *Roth Nov. Sp.* 321. *Acanthus repens*, *Vahl Symb.* ii. 76. *A. maderaspatensis*, *Linn. Herb. partly*.

DECCAN PENINSULA; common in the Carnatic, and from Delhi and Chota Nagpore to CEYLON.

A wiry perennial; branches 3–6 in., prostrate, usually roughly hairy. *Leaves*  $\frac{1}{2}$ –1 in., subsessile, obtuse. *Bracts* and *bracteoles* bristle-ciliate; bracts shorter than the bracteoles. *Calyx* and *corolla* nearly as of *B. boerhaaviæfolia*, but much smaller; corolla (including the larger lip) only  $\frac{1}{4}$ – $\frac{1}{3}$  in. *Capsule* and *seeds* as of *B. boerhaaviæfolia*, but the seeds appear (even when dry) shaggy, from the numerous bundles of annular tubes being connected only at the base.—As in *B. boerhaaviæfolia*, only 2-ovulate ovaries and 2-seeded capsules have been seen.

4. ***B. sindica***, *Stocks*; *T. Anders. in Journ. Linn. Soc.* ix. 500; leaves linear or narrowly oblong pubescent, heads few- or many-fl'd., bracteoles linear hairy shorter than the bracts, capsule 2-seeded. *Acanthodium grossum*, *Wight Ic.* tt. 1535, 1536, *not of Nees*.

SCINDE; *Stocks, Dalzell*. PUNJAB; *Stewart, Vicary, Aitchison*.

*Stems* 3–6 in., or very short. *Leaves* 1–2 in., toothed or subspinescent. *Heads* few- or many-fl'd., 3–4 in. in fruit, quadrifarious; bracts 1 in. or more, ovate with divaricate lanceolate tips, prickly, hairy within and without; bracteoles  $\frac{1}{3}$  in. *Calyx* softly hairy; 2 outer segments  $\frac{2}{3}$  in., ovate; 2 inner  $\frac{1}{3}$  in. narrowly ovate. *Corolla*  $\frac{1}{2}$ – $\frac{2}{3}$  in. *Capsule*  $\frac{1}{3}$  in., ellipsoid, compressed, shining brown. *Seeds*  $\frac{1}{4}$  in.; appearing echinate, but the tufts of tubes (even in the dry state) have all their ends free.

5. ***B. edulis***, *Pers. Syn.* ii. 180; leaves elliptic or oblong glaucous or pubescent, heads few- or many-fl'd., bracteoles linear hairy shorter than the bracts, capsule 2-seeded. *T. Anders. in Journ. Linn. Soc.* ix. 500; *Boiss. Fl. Orient.* iv. 520. *Acanthus edulis*, *Forsk. Fl. Æg.-Arab.* 114. *A. Delillii*, *Spreng. Syst.* ii. 819. *Ruellia persica*, *Burm. Fl. Ind.* p. 135, t. 42, fig. 1. *Acanthodium spicatum*, *Delile Fl. Eg.* 97, t. 33, fig. 3; *Nees in DC. Prodr.* xi. 274.

PUNJAB and SCINDE (*T. Anderson*).—DISTRIB. S.W. Asia, N.E. Africa.

*Stems* short or 1 foot or more, branched. *Leaves* often  $\frac{1}{2}$  in. broad, spinescent. *Bracts* longer and more spinous than in *B. sindica*. *Corolla*  $\frac{2}{3}$ – $\frac{3}{4}$  in., blue.—This differs from *B. sindica* by the broader usually glabrous-glaucous leaves, and the larger flowers: no Indian specimens have been seen. *Ruellia ciliaris*, *Linn. Mant.*



89, adduced as a syn. by *Nees* and *T. Anderson*, described as from India with ciliate leaves, seems more likely to have been *Blepharis boerhaaviæfolia*, i. e. Burmann's *ciliaris*.

## XXI. ACANTHUS, Linn.

Erect or twining shrubs, or herbs. *Leaves* pinnatifid, toothed, spinous or rarely entire. *Spikes* terminal or pseudo-axillary, dense strobiliform or interrupted; bracts ovate, large spinescent, or small; bracteoles large, lanceolate, rarely 0; flowers subsessile, blue or white. *Sepals* 4, 2 outer opposite, 2 inner opposite smaller. *Corolla-tube* short, ovoid, horny; limb of 2 lips, upper obsolete, lower elongate obovate, shortly obtusely 3-lobed. *Stamens* 4, didynamous, shorter than the lip; filaments stout, narrowed curved below the anther, not excurrent near the apex; anthers oblong, 1-celled, bearded. *Disc* 0. *Ovary* 4-ovulate; style very shortly 2-fid; ovules 2 in each cell. *Capsule* ellipsoid, compressed, shining chestnut-brown, 4-seeded. *Seeds* compressed, orbicular, without hairs; testa very lax.—Species 14, in the warm and hot zones of the Old World.

1. **A. carduaceus**, *Griff. Itin. Notes*, 144, and *Ic. Pl. As. Or.* t. 427; leaves large sessile elliptic deeply pinnatifid glabrous lobes toothed spinescent, spikes long woolly, bracteoles 1 in. linear silky-woolly. *T. Anders. in Journ. Linn. Soc.* ix. 500.

BHOTAN; Oongar, *Griffith*.

A robust shrub, scandent on rocks (*Griffith*). *Leaves* 12–20 by 6 in., black-green or (*Griff. Priv. Journ.* 265) flesh-coloured; lobes lanceolate. *Spikes* 6–12 in., crowded towards the ends of the branches, and on long axillary peduncles, the leaves at the base of the sessile spike being only 2–4 in. long, strobiliform, obscurely 4-ranked; bracts  $1\frac{1}{4}$  by  $\frac{3}{4}$  in., ovate, hairy within and without, spinous; bracteoles lanceolate. *Calyx* silky, 2 outer lobes  $\frac{3}{4}$ –1 in., lanceolate one shortly 2-toothed; 2 inner lobes  $\frac{2}{3}$  in., lanceolate. *Corolla*  $1\frac{1}{4}$  in., white (*Griffith*), altogether as in the genus. *Capsule* 1– $1\frac{1}{4}$  in., ellipsoid, compressed, glabrous, shining brown, 4-seeded, much as of *A. ilicifolius*.

2. **A. leucostachyus**, *Wall. Cat.* 2512; leaves short-petioled elliptic or oblong spinous-serrate slightly hairy beneath, spikes hairy, bracteoles  $\frac{3}{4}$  in. linear-lanceolate hairy. *Nees in Wall. Pl. As. Rar.* iii. 98, and in *DC. Prodr.* xi. 270; *T. Anders. in Journ. Linn. Soc.* ix. 501.

KHASIA MTS., alt. 0–3000 ft., frequent; *Wallich, &c.* Namroop in the PATKOYE MTS., *Griffith*. CACHAR; *Keenan*.

*Stem* 6–15 in., decumbent, viscous-woolly. *Leaves* 8 by  $3\frac{1}{2}$  in., cuneate at both ends, whitened beneath; nerves beneath viscous-pubescent, prominently reticulate; petiole  $\frac{2}{3}$  in., woolly. *Spikes* 3–6 in., mostly terminal, solitary; bracts  $\frac{3}{4}$ –1 by  $\frac{1}{2}$  in., elliptic, spinous-toothed, hairy on both sides. *Calyx* softly hairy; 2 outer lobes  $\frac{2}{3}$  in., one shortly 2-toothed; 2 inner  $\frac{1}{3}$ – $\frac{1}{2}$  in., sublinear. *Corolla*  $\frac{3}{4}$  in., white (*Nees*). *Capsule*  $\frac{1}{2}$ – $\frac{2}{3}$  in., ellipsoid, compressed, glabrous, shining-brown, 4-seeded.—The capsule and seeds greatly resemble *A. ilicifolius*, but are not ripe.

3. **A. longipetiolatus**, *Kurz For. Fl.* ii. 241; leaves long-petioled ovate subserrate pubescent on the nerves beneath, bracts obovate spinous-toothed softly hairy, corolla  $1\frac{1}{2}$  in. nearly glabrous.

PEGU; *Brandis* (Herb. Kurz).

*Stem* 1 foot, rather stout, decumbent, rooting, then erect, simple, rusty-pubescent. *Leaves*  $6\frac{1}{2}$  by  $3\frac{1}{4}$  in., cuneate subacute at both ends, serratures very shallow not spinescent; petiole nearly 2 in. *Spike* solitary, simple,  $5\frac{1}{2}$  by  $1\frac{1}{2}$  in., continuous; peduncle  $\frac{1}{2}$  in., stout, pubescent; bracts  $\frac{3}{4}$  by  $\frac{1}{2}$  in., teeth few, large; bracteoles 1 in., linear-subulate, hairy. *Sepals* 5, softly hairy; one  $1\frac{1}{4}$  by  $\frac{1}{2}$  in. oblong obtuse, two



1 by  $\frac{1}{2}$  in. oblong, two  $\frac{2}{3}$  by  $\frac{1}{10}$  in. *Corolla* and *stamens* as in *A. ilicifolius*, the curving of the top of the filament insisted on by Kurz being the same as in the other species of *Acanthus*, and without the excurrent point of *Blepharis*. *Capsule* not seen.

4. **A. ilicifolius**, Linn.; Benth. *Fl. Austral.* iv. 548; leaves shortly petioled oblong or elliptic toothed or pinnatifid spinous rigid glabrous, spikes elongate often interrupted, bracteoles broadly lanceolate glabrous, calyx  $\frac{2}{3}$  in., corolla  $1\frac{1}{4}$  in. blue. *Burm. Fl. Ind.* 138; *Blume Bijl.* 806; *Wall. Cat.* 2511; *Roxb. Fl. Ind.* iii. 32; *T. Anders. in Journ. Linn. Soc.* ix. 501; *Kurz For. Fl.* ii. 241. *A. Doloarius*, Blanco *Fl. Filip.* 487. *Dilivaria ilicifolia*, Nees in *Wall. Pl. As. Rar.* iii. 98, and in *DC. Prodr.* xi. 268; *Wight Ic.* t. 459; *Dalz. & Gibs. Bomb. Fl.* 192.—*Rheede Hort. Mal.* ii. t. 48.

Sea-coast, from MALABAR to CEYLON, and from the Soonderbund to Malacca.—**DISTRIB.** Malaya to the Philippines and Australia.

*Stems* 1–5 ft., in clumps, little divided, terete, glabrous. *Leaves* 6 by  $2\frac{1}{2}$  in.; petiole  $\frac{1}{4}$  in., base usually spinous. *Spikes* 4–16 in., terminal, commonly solitary; flowers mostly opposite; bract  $\frac{1}{3}$ – $\frac{2}{3}$  in., ovate, acute, glabrous; bracteoles  $\frac{1}{4}$ – $\frac{1}{3}$  in. *Sepals*, 2 outer elliptic rounded, 2 inner broadly lanceolate subacute. *Corolla* pubescent within. *Capsule*  $1\frac{1}{4}$  by  $\frac{2}{3}$  in. *Seeds*  $\frac{1}{4}$ – $\frac{1}{3}$  in., testa white very lax.

**VAR.** *integrifolia*, T. Anders. in Thwaites *Enum.* 232; leaves lanceolate entire tip acute spinous.—Ceylon; Thwaites.

5. **A. ebracteatus**, Vahl *Symb.* ii. 75, t. 40; leaves shortly petioled oblong or elliptic toothed or pinnatifid spinous rigid glabrous, spikes elongate somewhat lax, bracts caducous, bracteoles obsolete, calyx  $\frac{1}{2}$  in., corolla  $\frac{3}{4}$  in. white. *Blume Bijl.* 806; *T. Anders. in Journ. Linn. Soc.* ix. 501; *Kurz For. Fl.* ii. 242. *A. ilicifolius*, Lour. *Fl. Cochinch.* 375, not of Linn.; *Wall. Cat.* 2511, E and part D. *Dilivaria ebracteata*, Pers. *Syn.* ii. 179; Nees in *Wall. Pl. As. Rar.* iii. 98, and *Cat.* 7169, and in *DC. Prodr.* xi. 269.—*Rumph. Amb.* vi. t. 71, fig. 1.

MALACCA; Griffith, Maingay. ANDAMANS; ex Kurz.—**DISTRIB.** Siam, Java, Cochin China.

*Stems* and leaves of *A. ilicifolius*; base of petiole spinous or not. *Bracts*  $\frac{1}{4}$  in., usually caducous before the flowers expand. *Capsule*  $\frac{3}{4}$  in.—Seems to differ from *A. ilicifolius* by the much smaller calyx, corolla and capsule. Vahl puts the difference too strongly when he says the flowers are only one quarter the size. Bentham (*Fl. Austral.* iv. 548) doubts the distinctness of the species. Herbarium examples of *A. ilicifolius* with the flowers in bud, which show neither the evanescence of the bracts nor the true size of the corolla, can only be distinguished by the presence of the bracteoles.

6. **A. volubilis**, Wall. *Pl. As. Rar.* ii. 56, t. 172; twining, unarmed, leaves oblong or elliptic entire glabrous, spikes linear-oblong, bracteoles 0, corolla white. *T. Anders. in Journ. Linn. Soc.* ix. 501; *Kurz For. Fl.* ii. 242. *Dilivaria volubilis*, Nees in *Wall. Pl. As. Rar.* iii. 98; *Griff. Notul.* iv. 138. *D. scandens*, Nees in *DC. Prodr.* xi. 269.

Sea-shores of the MALAY PENINSULA; Soonderbund, Wallich, &c.; Pegu, Kurz; Mergui, Griffith.—**DISTRIB.** Siam.

*Stems* twining in long grass, internodes often 4–8 in. *Leaves*  $3\frac{1}{2}$  by  $1\frac{1}{4}$  in., obtuse or subacute, base attenuated; petiole  $\frac{1}{3}$  in. *Spikes* 2–3 in., hardly interrupted; flowers sub-2-seriate; bracts  $\frac{3}{4}$  in., elliptic, acute. *Calyx*  $\frac{1}{3}$ – $\frac{1}{2}$  in., outer segments elliptic, acute, glabrous; inner similar, much shorter. *Corolla* 1 in., white, slightly tinged yellow (Wallich), probably when fading; rose (Nees).—The syn. of Rumphius (*Herb. Amb.* vi. t. 71, fig. 2, wrongly cited as t. 72 by Nees) has alternate leaves and fruits quite unlike *Acanthaceæ*.



7. **A. longibracteatus**, Kurz in *Flora* 1870, 363, and in *Journ. As. Soc.* 1870, ii. 79; leaves long-petioled ovate or elliptic-oblong acute at both ends remotely toothed pubescent, spikes terminal linear-oblong, bracts lanceolate spinous-mucronate, corolla  $\frac{2}{3}$  in.

PEGU; Brandis (fide Kurz).

Annual, 3–5 in.; stems terete, decumbent or ascending, densely puberulous. Leaves 2 in., membranous, setulose between the teeth, sparsely hairy above, nerves beneath pubescent. Spikes as in *A. leucostachyus*; rachis pilose; bracts  $\frac{1}{3}$  in., pubescent, lower entire, upper with 2 or 3 spinous teeth on each side; bracteoles as long as the bracts, linear. Calyx  $\frac{1}{2}$  in., adpressedly pubescent and nervose; lower segment deeply 2-fid, lobes lanceolate acuminate. Corolla 5-lobed, minutely hirsute in the throat.—Copied from Kurz. Notwithstanding the narrow bracts and small corolla, I suspect that this is Kurz's subsequently described *A. longipetiolatus*.

## XXII. **BARLERIA**, Linn.

Undershrubs or herbs, spinescent or unarmed. Leaves opposite, entire. Flowers showy, purple blue yellow or white, sessile, solitary or in dense or sub lax spikes; bracts and bracteoles large, small or 0. Sepals 4, in opposite pairs, outer pair very much the larger, anterior often emarginate bifid or deeply 2-lobed. Corolla-tube elongate, sometimes very long, funnel-shaped upwards; lobes 5, subequal, ovate, or elliptic, imbricate in bud. Stamens 2 with oblong 2-celled anthers; 2 small, rudimentary, or rarely with a few grains of pollen; rudimentary 5th often present. Disc large, often a toothed cup half enclosing the ovary. Ovary 4-ovulate; style long, shortly bifid or subentire. Capsule ovoid or oblong, 2- or 4-seeded below the middle. Seeds compressed, ovate, hairs wavy silky close-adpressed non-elastic (except in *B. Gibsoni*).—Species 60, tropical, mostly Old World.

*Barleria lupulina*, Lindl. in Bot. Reg. t. 1483, is frequently cultivated in India, and appears as an escape.

*Barleria rubra*, Ham., and *B. spicata*, Roxb., are entered in Steudel's Nomenclature as Indian: but it is not known from what source obtained.

Subgenus 1. **Prionitis**. Capsule ovoid, beak solid, 2-seeded close to the base.

1. **B. Prionitis**, Linn.; Nees in Wall. Pl. As. Rar. iii. 93, and in DC. Prodr. xi. 237; leaves elliptic acuminate at both ends spine-tipped glabrous or sometimes tawny sericeous beneath, flowers in terminal spikes yellow, bracts large elliptic spine-tipped, bracteoles very small bristles or 0. Burm. Fl. Ind. 135; Blume Bijdr. 805; Wall. Cat. 2510; Roxb. Fl. Ind. iii. 36; Decne. in Nouv. Ann. Mus. iii. 388; Wight Ic. t. 452; Dalz. & Gibs. Bomb. Fl. 189; T. Anders. in Journ. Linn. Soc. ix. 490. *B. Hystrix*, Linn. Mant. 89; Wall. Cat. 7145; Nees in Wall. Pl. As. Rar. iii. 93, and in DC. l. c. 239. *B. pubiflora*, Benth. in Flora 1849, 558. *Prionitis Hystrix* & *pubiflora*, Miq. Fl. Ind. Bat. ii. 809, 810.—Rumph. Herb. Amb. vii. 13. Rheede Hort. Mal. ix. t. 41.

Tropical India; from the HIMALAYA to CEYLON and MALACCA, probably in most cases introduced.—DISTRIB. Tropical Asia and Africa.

A bush, 2–5 ft., sometimes planted for a fence; usually very prickly, rarely nearly unarmed; densely scabrid lineolate, sometimes puberulous. Leaves 4 by  $1\frac{1}{2}$  in., entire; petioles of the lower leaves usually distinct sometimes  $\frac{1}{2}$ –1 in. Flowers axillary, 1–3-nate, uppermost spiked; bracts  $\frac{1}{2}$ –1 in., entire, the lower larger, foliaceous. Sepals broadly lanceolate, acuminate, 2 outer  $\frac{2}{3}$ – $\frac{3}{4}$  in., 2 inner  $\frac{1}{2}$  in. Corolla  $1\frac{1}{4}$ – $1\frac{3}{4}$  in., glabrous or puberulous. Stamens 4, 2 minute or sterile. Disc annular.



*Pistil* glabrous. *Capsule*  $\frac{3}{4}$ –1 in., 2-seeded. *Seeds*  $\frac{1}{3}$  in. diam., much compressed, ovate.

2. **B. cuspidata**, Heyne; Nees in Wall. Pl. As. Rar. iii. 93, and in DC. Prodr. xi. 239; glabrous, leaves subsessile narrowly oblong-lanceolate spine-tipped, flowers axillary scarcely spiked at the end of the branches, bracts lanceolate acuminate spine-tipped, bracteoles minute bristles or 0. Wall. Cat. 2499; Wight Ic. t. 451; T. Anders. in Journ. Linn. Soc. ix. 490.

S. DECCAN PENINSULA, alt. 0–2000 ft.; Concan, Carnatic, Mysore, Coimbatore, Rottler, Wight, &c.

A lower, harsher, more prickly undershrub than *B. Prionitis*, with shorter internodes. Leaves  $2\frac{1}{2}$  by  $\frac{1}{3}$  in., occasionally 1 by  $\frac{1}{3}$  in., elliptic, entire. Flowers nearly all axillary, distant; bracts  $\frac{1}{2}$ – $\frac{3}{4}$  in., usually very narrow. Calyx  $\frac{3}{4}$ –1 in., segments long acuminate. Corolla  $1\frac{1}{2}$  in., yellow. Capsule and seeds as of *B. Prionitis*.—Exceedingly near *B. Prionitis*, as Heyne has noted in Herb. Rottler. Nees erroneously says the corolla is pale blue; does not allow it to have been *B. cuspidata*, Heyne, but says it is part of *B. noctiflora*, Heyne. Heyne has, however, named these two species correctly in Rottler's Herbarium.

3. **B. Hochstetteri**, Nees in DC. Prodr. xi. 231; pubescent, leaves elliptic or oblong entire, flowers pedicelled, bracteoles small narrow remote from the calyx, corolla  $\frac{3}{4}$ –1 in. lilac. Wight Ic. t. 1528; Hook. Ic. Pl. t. 803; T. Anders. in Journ. Linn. Soc. ix. 494; Boiss. Fl. Orient. iv. 523. Barlerites Hochstetteri, Oerst. in Vidensk. Meddel. Kjob. 1854, 137.

SCINDE; Stocks.—DISTRIB. S.W. Asia, N.E. Africa.

A woody, harsh undershrub, scarcely 1 foot high, sometimes spinescent. Leaves 2 by  $\frac{3}{4}$ –1 in., obtuse, base narrowed; petiole  $\frac{1}{3}$  in. Pedicels  $\frac{1}{4}$ – $\frac{1}{3}$  in., pubescent, often 3 on an apparent peduncle, the 2 leaves at their base much reduced, usually petioled, oblong or sublinear; bracteoles about the middle of the pedicel 2, 1, or 0, very small, linear (? bracts). Calyx green, pubescent; 2 outer lobes  $\frac{1}{3}$ – $\frac{1}{2}$  in., triangular-ovate, 2 inner very small. Stamens 2, the 3 smaller nearly obsolete. Disc prominent, cup-shaped. Ovary hairy; stigma scarcely bifid. Capsule nearly  $\frac{1}{2}$  in., pubescent, ovoid, rostrate, 2-seeded near the base. Seeds densely silky.—Oersted attributes to his very bad genus *Barlerites* a unilateral linear stigma and glabrous seeds, which is wholly wrong.

Subgenus 2. **Eubarleria**. Capsule oblong or narrowly ellipsoid, 4-rarely 2-seeded at or near the middle by the suppression of the 2 lower seeds.

\* *Bract* 0, *bracteoles* 2 *divaricate long-linear or spines*, 2 *outer sepals large*. [Each flower on the sympodal raceme is in the axil of one of two opposite bracteoles, and the terminal flower also is apparently 2-bracteolate; by comparing such species as *B. longiflora* & *tomentosa*, it is seen that it is the bracteoles that are really aborted in this section. The next section differs in the terminal flower having 3 (or 4) bracts in place of 2.]

† *Prickly*.

4. **B. buxifolia**, Linn.; Nees in Wall. Pl. As. Rar. iii. 94, and in DC. Prodr. xi. 241; leaves small broadly elliptic obtuse mucronate hairy, flowers solitary pedicelled or sessile, 2 outer sepals oblong entire. Roth Nov. Sp. 313; Wall. Cat. 2504, partly; Roxb. Fl. Ind. iii. 37; Wight Ic. t. 870; T. Anders. in Journ. Linn. Soc. ix. 489. Dicranacanthus buxifolia, Oerst. in Vidensk. Meddel. Kjob. 1854, 136.

S. DECCAN PENINSULA, alt. 0–4000 ft.; Rottler; Courtallum, Wight; Concan, Law, &c.



A small, very prickly undershrub; branches hairy. *Leaves*  $\frac{1}{3}$ – $\frac{2}{3}$  in.; petiole hardly any. *Bracteoles*  $\frac{1}{4}$ – $\frac{3}{4}$  in., simple spines; pedicel (above the bracteoles)  $\frac{1}{8}$ – $1\frac{1}{2}$  in., sometimes 0 (*B. rotundifolia*, Heyne in Herb. Rottler). *Sepals* pubescent, ciliate; 2 outer in flower  $\frac{1}{3}$  by  $\frac{1}{6}$  in. often lanceolate, in fruit sometimes  $\frac{2}{3}$  in., oblong, obtuse, scarious, nervose, glabrate; 2 inner small. *Corolla* 1 in., purple blueish rose or white. *Capsule*  $\frac{3}{4}$  in., 4-seeded.—Separable from the following by the much narrower entire outer sepals. The variation in the length of the pedicel is remarkable, but there appears to be only one species here.

5. ***B. mysorensis***, Roth Nov. Sp. 313; leaves broadly elliptic obtuse mucronate hairy, flowers axillary sessile, 2 outer sepals large ovate sub-spinose denticulate softly hairy. Heyne in Herb. Rottler. *B. buxifolia*, Wall. Cat. 2504, sheets A and B partly, not of Linn. *B. spina-ceylanica*, Nees in DC. Prodr. xi. 242; T. Anders. in Journ. Linn. Soc. ix. 490. *B. bispinosa*, Nees in Wall. Pl. As. Rar. iii. 94, and in DC. Prodr. xi. 241, not of Vahl. *Dicranacanthus spina-ceylanica*, Oerst. in Vidensk. Meddel. Kjob. 1854, 136.

S. DECCAN PENINSULA with CEYLON, alt. 0–4000 ft.; Rottler, Wight, Thwaites, &c.

A very prickly small shrub; branches hairy. *Leaves*  $\frac{1}{3}$ –1 in., hairy beneath, deciduously scabrid pubescent above; petiole hardly any. *Bracteoles* simple spines. Outer *sepals*  $\frac{3}{4}$ –1 by  $\frac{2}{3}$  in., broadest very near the base; in fruit scarious, nerved. *Corolla*  $1\frac{1}{2}$  in., purple. *Capsule*  $\frac{3}{4}$  in., 4-seeded.—Nees reduced *B. mysorensis*, Heyne, to *B. noctiflora*, but both Heyne's examples and Roth's description show it to have been this.

6. ***B. noctiflora***, Linn. f. Suppl. 290; leaves oblong or narrowly obovate mucronate pubescent afterwards glabrate, flowers axillary solitary, 2 outer sepals large ovate acute spinous-dentate sparsely pubescent, corolla-tube elongate narrowly cylindric. Heyne in Herb. Rottler; Wall. Cat. 2496; Nees in Wall. Pl. As. Rar. iii. 93, and in DC. Prodr. xi. 240, excl. syn. Roth; T. Anders. in Journ. Linn. Soc. ix. 490 (by typog. error *B. noctifolia*). *B. cristata*, Lamk. Dict. i. 380, not of Linn. *Barleriacanthus noctiflora*, Oerst. in Vidensk. Meddel. Kjob. 1854, 136.

NILGHERY MTS., alt. 7500 ft.; Ootacamund, Wight. CEYLON; Rottler.

A small, very prickly undershrub; branches pubescent upwards. *Leaves*  $\frac{3}{4}$  by  $\frac{1}{6}$  in., obtuse or acute, grey pubescent at first; petiole hardly any. *Bracteoles*  $\frac{1}{4}$ – $\frac{3}{4}$  in., with simple spines or denticulate near the base. *Sepals* soon scarious, glabrate, nervose; 2 outer  $\frac{3}{4}$  by  $\frac{1}{3}$ – $\frac{1}{2}$  in. *Corolla-tube*  $1\frac{1}{4}$  by  $\frac{1}{8}$  in., pubescent without; lobes  $\frac{1}{3}$  in., round-ovate. *Capsule*  $\frac{2}{3}$  in., 4-seeded.

7. ***B. acanthoides***, Vahl Symb. i. 47; leaves obovate or elliptic obtuse mucronate pubescent, flowers solitary or in dense 1-sided spikes, 2 outer sepals ovate subentire pubescent, corolla-tube very long sublinear. Nees in DC. Prodr. xi. 240; T. Anders. in Journ. Linn. Soc. ix. 490 (excl. syn. *B. candida*); Boiss. Fl. Orient. iv. 524. *Barleriacanthus acanthoides*, Oerst. in Vidensk. Meddel. Kjob. 1854, 136.

SCINDE; Stocks. PUNJAB; Kirana Hill, Edgeworth.—DISTRIB. Arabia, N.E. Africa.

A small, hoary, prickly undershrub; prickles often pinnatifid near the base. *Leaves*  $1\frac{1}{4}$  by  $\frac{1}{2}$  in., base attenuated; petiole 0– $\frac{1}{6}$  in. *Bracteoles* linear or linear-lanceolate, spine-tipped, rigid, often denticulate. *Sepals* soon scarious, glabrate, nervose; 2 outer  $\frac{1}{2}$  by  $\frac{1}{3}$  in., acute, mucronate, scarcely denticulate. *Corolla* white; tube  $2\frac{1}{2}$  by  $\frac{1}{8}$ – $\frac{1}{6}$  in., puberulous without; lobes  $\frac{1}{3}$  in., ovate. *Capsule*  $\frac{2}{3}$  in., 4-seeded.



†† *Unarmed.*

8. **B. longiflora**, *Linn. f. Suppl.* 239; pubescent, leaves petioled ovate, flowers in short dense few-fl. spikes or solitary, bracteoles very long linear laxly patent, corolla-tube very long linear pubescent without. *Vahl Symb.* i. 46, t. 16; *Gaertn. Fruct.* i. 253, t. 54; *Wall. Cat.* 2501; *Roxb. Fl. Ind.* iii. 40; *Nees in Wall. Pl. As. Rar.* iii. 93, and in *DC. Prodr.* xi. 235. *B. longifolia*, *T. Anders. in Journ. Linn. Soc.* ix. 491, by typog. error not of *Linn.* *Barleriosiphon longiflorus*, *Oerst. in Vidensk. Meddel. Kjob.* 1854, 136.

S. DECCAN PENINSULA; *Rottler, &c.*; Tinnevely, *Beddome*.

A shrub, 2–4 ft. *Leaves*  $1\frac{3}{4}$  by 1 in., subacute, base rounded, entire; petiole  $\frac{1}{4}$ – $\frac{1}{2}$  in. *Spikes* mostly 1–4-fl.; bracteoles  $\frac{1}{2}$ –1 by  $\frac{1}{10}$  in., softly pubescent. *Sepals* pubescent, afterwards scarious, glabrate, nervose; 2 outer  $\frac{3}{4}$ –1 by  $\frac{1}{2}$  in., ovate, entire. *Corolla-tube* 2–3 by  $\frac{1}{8}$  in.; lobes  $\frac{1}{3}$ – $\frac{1}{2}$  in., ovate. *Capsule*  $\frac{2}{3}$  in., 4-seeded.

9. **B. tomentosa**, *Roth Nov. Sp.* 314; leaves elliptic or ovate acuminate at both ends yellow-hirsute above, bracteoles linear or linear-spathulate, sepals oblong acute young scarious coloured, corolla 2–2½ in. glabrous. *Nees in Wall. Pl. As. Rar.* iii. 92, and in *DC. Prodr.* ix. 233; *T. Anders. in Journ. Linn. Soc.* ix. 451. *B. paniculata*, *Wall. Cat.* 2407; *Nees in Wall. Pl. As. Rar.* iii. 92, and in *DC. Prodr.* xi. 233.

S. DECCAN PENINSULA; *Rottler, &c.*

A low shrub; branches hirsute. *Leaves*  $2\frac{1}{4}$  by 1 in., yellow-hirsute on the nerves beneath, more or less so on the surface; petiole  $\frac{1}{4}$  in. *Racemes* mostly 1–3-fl.; bracteoles  $\frac{1}{3}$ – $\frac{2}{3}$  in. *Calyx* scarious, purple-veined before the flower expands; 2 outer segments  $\frac{1}{3}$  in., broadly oblong, entire, 2 inner  $\frac{1}{6}$  in.; elongated in fruit. *Corolla* rose (*Beddome*); tube 2 in., linear-cylindric, upper  $\frac{1}{2}$  in., funnel-shaped; lobes  $\frac{2}{3}$  in., elliptic. *Capsule*  $\frac{3}{4}$  in., 4-seeded, occasionally the 2 lower seeds suppressed.

*VAR. acuminata*; leaves densely pubescent subtomentose rounded or subcordate at the base, petiole 1 in. *B. acuminata*, *Wight Ic.* t. 450; *Nees in Wall. Pl. As. Rar.* iii. 93, and in *DC. Prodr.* xi. 234. *B. tomentosa*, *Wall. Cat.* 2503. *B. racemosa*, *Heyne in Herb. Rottler.*—S. Deccan Peninsula; Nilgherries, Anamallays, Madura, &c., *Rottler, Wight, &c.*—Easily distinguished from *B. tomentosa*, but differs only in the shape of the leaves and indumentum; the corolla is somewhat smaller.

10. **B. involucrata**, *Nees in Wall. Pl. As. Rar.* iii. 92, and in *DC. Prodr.* xi. 232; leaves elliptic narrow at both ends yellow-strigose on the nerves beneath, racemes few-fl. axillary, bracteoles lanceolate or linear much shorter than the sepals, sepals 1 in. elongate elliptic, corolla 2 in. blue. *Wight Ill.* t. 164; *T. Anders. in Journ. Linn. Soc.* ix. 492. *B. pentandra*, *Arn.*; *Nees in DC. Prodr.* xi. 232; *T. Anders. in Thwaites Enum.* 230, partly. *B. Macraei*, *Arn. ms.*

CEYLON, in the hills; *Macrae, Gardner, &c.* MALABAR (*var. elata*).

Herbaceous, strigose. *Leaves*  $4\frac{1}{2}$  by  $1\frac{3}{4}$  in., sparsely yellow strigillose above; petiole  $\frac{1}{2}$  in. *Racemes* yellow-strigose; bracteoles  $\frac{1}{2}$  by  $\frac{1}{3}$  in. (in *Nees' type*),  $\frac{1}{3}$  by  $\frac{1}{20}$  in. (in *Arnott's B. pentandra*). *Sepals* subacute. *Corolla-tube*  $1\frac{1}{4}$  in.; lobes  $1\frac{1}{4}$  in., obovate-elliptic. *Capsule* nearly 1 in., 4-seeded.—*Nees* has confounded the Ceylon and Nilgiri varieties of this species; his description of *B. involucrata* is founded on *Wight's n. 1958* from Ceylon, and he says the bracteoles are 4 lines long; he then places under this the Malabar specimens, which do not suit the description, and which all belong to his *B. terminalis* (see *B. strigosa*, var.). The Ceylon specimens are very uniform, drying black, and having the racemes mainly axillary. The bracteoles are in well-developed specimens much longer than in the poor pieces *Nees* and *Arnott* had, but still much shorter than in *B. elata*. *Wight's n. 1958* has the bracteoles unusually broad and obtuse.



VAR. *elata*; leaves larger lower often a foot long, racemes stout helicoid often collected towards the ends of the branches, bracteoles often 1–1½ in., linear-lanceolate, corolla 3–3½ in. *B. elata*, Dalz. in *Hook. Kew Journ.* iii. 227; Dalz. & Gibs. *Bomb. Fl.* 189. *B. cœrulea*, Wall. *Cat.* 2509, sheet  $\beta$ , partly.—Malabar, alt. 2–5000 ft., from the Bombay Ghauts to the Pulneys and Anamallays, frequent; Gardner, &c.—Shrubby, 6 ft. high (Dalzell). In Wight's Nilgherry examples, the corolla-tube is 1¾ in., the upper ⅔ whereof is considerably inflated; the lobes are 1¾ by ¾ in., obovate, obtuse; the racemes form dense sub-leafless short terminal panicles.

11. ***B. vestita***, T. Anders. in *Thwaites Enum.* 230, and in *Journ. Linn. Soc.* ix. 492; leaves elliptic or somewhat obovate acuminate at both ends fulvous-shaggy on both surfaces, racemes lax, bracteoles linear-lanceolate, outer sepals elliptic elongate-acuminate, corolla 3 in. *Bedd. Ic. Pl. Ind. Or.* t. 263. *B. pentandra*, Var.  $\beta$ , Nees in *DC. Prodr.* xi. 233.

CEYLON, alt. 5000 ft.; Walker, Thwaites.

Herbaceous; stems stout, hirsute. Leaves 7 by 3 in.; nerves 12–15 pair, conspicuous; petiole ¼–⅓ in. Racemes on peduncles 3 in., i.e. the leaves at their base ¾ in., linear-lanceolate, scarcely larger than the other bracts; lower flowers 1 in. or more apart. Calyx and corolla exactly as of *B. involucrata*, of which Nees considered it a var.

\*\* Bracteoles 2, opposite, close to the calyx or above the bract at the base of the pedicel, narrow, much smaller than the 2 outer sepals.

12. ***B. pilosa***, Wall. *Cat.* 2502; softly hairy, leaves ovate acuminate, flowers axillary solitary, outer sepals ovate or orbicular scarious dentate, corolla 1½ in. blue. Heyne in *Herb. Rottler*; Nees in Wall. *Pl. As. Rar.* iii. 93, and in *DC. Prodr.* xi. 234; T. Anders. in *Journ. Linn. Soc.* ix. 491; *Bedd. Ic. Pl. Ind. Or.* t. 256.

S. DECCAN PENINSULA, alt. 1000–1500 ft.; Courtallum, Rottler, Wight; Coimbatore, Beddome.

A small, ramous shrub. Leaves 4 by 2 in., often much smaller on the lateral flower-bearing branchlets, sometimes obscurely denticulate; petiole 2 in. Pedicels ½ in.; bracteoles ¼–⅓ in., linear, subdenticulate, hairy, above the base of the pedicel. Sepals hairy, ultimately glabrate, nervose; 2 outer ⅓–½ in. diam., subspinosely toothed. Corolla glabrous; tube nearly 1 in.; lobes ⅓–½ in., broadly elliptic. Capsule ½ in., 4-seeded; seeds shaggy, the hair finally rubbing off except near the hilum.

13. ***B. Lawii***, T. Anders. in *Journ. Linn. Soc.* ix. 492; leaves elliptic acuminate at both ends lineolate above fulvous-strigose on the nerves beneath, racemes short capitate, bracts and bracteoles small linear, outer sepals 1 in. elliptic acute entire, corolla 3–3½ in. minutely pilose without. *B. Beddomei*, *Bedd. Ic. Pl. Ind. Or.* t. 258.—*Barleria* sp. n. 33, *Herb. Ind. Or. H. f. & T.*

W. DECCAN PENINSULA, in the Ghauts; Bababoodun Hills, Law (T. Anderson).

An erect shrub; branches strigose upwards. Leaves 6 by 2¼ in.; petiole ¼–⅓ in. Racemes fulvous-strigose; bracts ½ in., linear-spathulate; bracteoles nearly as long, linear, acute. Sepals nervose, strigose without; 2 outer ¼–⅓ in. broad, one of these shortly 2-toothed. Corolla white (Dalzell), beautifully veined when dry, noted blue in Wight's Herbarium; tube elongate funnel-shaped, lobes 1 in., obovate. Capsule nearly 1 in., oblong or slightly obovate, 4-seeded; fruiting-sepals somewhat enlarged.

14. ***B. Arnottiana***, Nees in *DC. Prodr.* xi. 232; leaves elliptic acuminate at both ends hairy, pedicels axillary solitary, bracteoles lanceolate,



outer sepals large ovate subobtuse, corolla  $2\frac{3}{4}$  in. *T. Anders. in Journ. Linn. Soc.* ix. 492.

CEYLON, alt. 6000 ft.; *Gardner, Thwaites, &c.*

Herbaceous; stems fulvous-strigose. *Leaves* 4 by  $1\frac{1}{2}$  in., with scattered yellow hairs above, obscurely lineolate, beneath yellow-strigose especially on the nerves; petiole  $\frac{1}{4}$ –1 in. *Bracteoles*  $\frac{1}{4}$ – $\frac{3}{4}$  in., lanceolate or elliptic spatulate or 0. *Outer sepals*  $1\frac{1}{4}$  by  $\frac{1}{2}$  in., yellow-strigose, obtuse, one shortly bifid. *Corolla* blue; tube  $1\frac{1}{2}$  in., lobes 1 in., obovate, subemarginate. *Capsule* 1 in., broadly oblong, 4-seeded; sepals enlarged, scarious, nerved in fruit.

VAR. *pentandra*; leaves thinner glabrescent conspicuously lineolate above, bracteoles  $\frac{1}{3}$  in., linear-setaceous, outer sepals elliptic elongate acute nearly glabrous. *B. pentandra, Arn.*; *T. Anders. in Thwaites Enum.* 230 partly, excl. syn.—Ceylon, *Thwaites* (C. P. n. 2558).

VAR. *Beddomei*; leaves elliptic acute at both ends bristly pubescent on both surfaces, flowers solitary axillary, sepals large ovate acute nervose bristly-pubescent.—Tenasserim; Mooleyit slopes, *Beddome*.—Herbaceous; stems fulvous-pubescent or substrigose. *Leaves* 3–4 by  $1\frac{1}{2}$  in., not acuminate, petiole  $\frac{1}{3}$  in. *Pedicel*  $\frac{1}{8}$  in.; bracteoles  $\frac{1}{4}$ – $\frac{1}{3}$  in., linear, rigid, bristly-pubescent. *Outer sepals* nearly 1 by  $\frac{1}{2}$  in., one of them very shortly bifid at the tip. *Corolla*  $2\frac{3}{4}$  in., beautifully veined when dry, altogether as of *B. Arnottiana*. *Capsule*  $\frac{3}{4}$  in., narrowly ellipsoid, rigid. *Seeds* more than  $\frac{1}{4}$  in. diam., obovate-truncate, compressed, rugose-silky.—Possibly a new species; close to *B. Arnottiana*.

15. **B. sepalosa**, *Clarke*; hairy, leaves elliptic acute, racemes axillary 1–3 fld., bracteoles narrowly lanceolate, outer sepals very large broadly elliptic acute.—*Barleria* sp. n. 35, *Herb. Ind. Or. H. f. & T.*

CONCAN; *Gibson*.

Shrubby; stems upward villous, subtomentose. *Upper leaves*  $3\frac{1}{2}$  by  $1\frac{1}{4}$  in., base shortly narrowed, covered with short yellow hairs on both surfaces, somewhat rigid, strongly reticulated beneath; petiole  $\frac{1}{2}$  in. *Bracteoles*  $\frac{3}{4}$  by  $\frac{1}{6}$  in., rigid, acute. *Outer sepals*  $1\frac{3}{4}$  by  $\frac{3}{4}$  in., one bifid, base rounded, yellow-villous, subtomentose, in fruit nervose, subscarious. *Capsule*  $\frac{3}{4}$ –1 in. *Corolla* not seen.

16. **B. montana**, *Nees in Wall. Pl. As. Rar.* iii. 92, and in *DC. Prodr.* xi. 232; nearly glabrous, leaves narrowly ovate acuminate at both ends, flowers axillary solitary and running into terminal spikes, outer sepals large ovate, corolla 2 in., seeds densely silky. *Dalz. & Gibs. Bomb. Fl.* 189; *T. Anders. in Journ. Linn. Soc.* ix. 493; *Bedd. Ic. Pl. Ind. Or.* t. 257. *B. purpurea, Lodd. Bot. Cab.* t. 344. *Ruellia?* *montana, Wall. Cat.* 2391.—*Barleria* sp. n. 32, *Herb. Ind. Or. H. f. & T.*

W. DECCAN PENINSULA, in the Ghauts frequent; from Jubbulpore to Travancore.

Herbaceous, erect, 2 ft. high. *Leaves* 5 by 2 in., often glaucous, margins sometimes minutely scabrous; petiole  $\frac{1}{4}$ –1 in. *Bracteoles* linear,  $\frac{1}{4}$  in. or in large examples 1 in. *Outer sepals*  $1\frac{1}{2}$  by  $\frac{3}{4}$  in. in large examples, often hardly half so large, rounded or very acute, entire, glabrous or minutely scabrous. *Corolla* blue (*Beddome*), rose (*Dalzell*); lobes  $\frac{2}{3}$  in. diam., orbicular. *Capsule* 1 in., 4-seeded. *Seeds*  $\frac{1}{4}$  in. diam. or more, close covered with wavy silky yellowish hair, as in many other species.

17. **B. Gibsoni**, *Dalz. in Hook. Kew Journ.* ii. 339; nearly glabrous, leaves ovate acute, flowers axillary solitary and running into terminal spikes, outer sepals large ovate, corolla 2– $2\frac{1}{2}$  in., seeds glabrous. *Dalz. & Gibs. Bomb. Fl.* 189; *T. Anders. in Journ. Linn. Soc.* ix. 493. *B. montana, Wight & Nees partly*; *Herb. Ind. Or. H. f. & T.* n. 34.

W. DECCAN PENINSULA; Concan, *Stocks*; Ellora Hill, *Ralph*; Belgaum, *Ritchie*; Bombay Ghauts and Brahminwara Range, *Dalzell*; N. Canara, *Brandis*.

So exceedingly like *B. montana*, except as to the seeds, that it has been mixed



therewith from Wight's day. Lower *leaves* often very large and very glaucous. Terminal *spike* more closely imbricated than in *B. montana*; flowers rather larger, corolla lobes often 1 in. *Capsule*  $\frac{3}{4}$  in., 4-seeded. *Seeds*  $\frac{1}{2}$  in. diam., when ripe nearly black; always glabrous, and so differing from all other *Barlerias*.

18. ***B. grandiflora***, Dalz. in *Hook. Kew Journ.* ii. 339; nearly glabrous, leaves elliptic narrowed at both ends, flowers solitary axillary, outer sepals very large broadly elliptic acute, corolla 4 in. white. Dalz. & Gibs. *Bomb. Fl.* 189; T. Anders. in *Journ. Linn. Soc.* ix. 493.

CONCAN; *Stocks*; Mangellee Ghaut, Dalzell.

Herbaceous; innovations shortly minutely pubescent. *Leaves* 5 by 2 in., often glaucous; petiole  $\frac{1}{6}$  in., pubescent. *Bracteoles*  $\frac{1}{3}$ – $\frac{2}{3}$  in., linear-ligulate. Outer *sepals* 2 by 1 in., entire, herbaceous, pubescent within. *Corolla* minutely pubescent without; lobes  $1\frac{1}{4}$  in. *Capsule* not seen.—Closely allied to *B. Gibsoni*.

19. ***B. cristata***, Linn.; Benth. *Fl. Hongk.* 262; leaves oblong or elliptic acute yellow-hairy beneath, spikes capitate, outer sepals ovate-acuminate or lanceolate toothed nervose, corolla  $1\frac{1}{2}$  in. purple-blue or white. *Burm. Fl. Ind.* 136; *Roxb. Fl. Ind.* iii. 37; *Wall. Cat.* 2506; *Don Prodr.* 119; *Roth Nov. Sp.* 315; *Nees in Wall. Pl. As. Rar.* iii. 92, and in *DC. Prodr.* xi. 229; *Bot. Mag.* t. 1615; *Wight Ic.* t. 453; Dalz. & Gibs. *Bomb. Fl.* 188; T. Anders. in *Thwaites Enum.* 230, and in *Journ. Linn. Soc.* ix. 490. *B. dichotoma*, *Roxb. Fl. Ind.* iii. 39; *Wall. Cat.* 2508; *Nees in Wall. Pl. As. Rar.* iii. 91, and in *DC. l. c.* 227; Dalz. & Gibs. *l. c.* 188. *B. ciliata*, *Roxb. l. c.* 38; *Wall. Cat.* 2507; *Nees in Wall. Pl. As. Rar.* iii. 92, and in *DC. l. c.* 228. *B. napalensis* & *nuda*, *Nees in Wall. Pl. As. Rar.* iii. 91, 92, and in *DC. l. c.* 228, 229. *B. laciniata*, *Wall. Cat.* 7144, and *Nees ll. c.*

SUBTROPICAL INDIA; N.W. Himalaya, Sikkim, Khasia, Burma, Central India, Nilgherries, common.—DISTRIB. Gardens of India, Malaya, China, &c.

An erect or diffuse undershrub; branches adpressedly yellow-hairy. *Leaves* 3–4 by 1 in., or, where burnt up, 1 by  $\frac{1}{3}$  in., yellow-hairy or lineolate above; petiole  $\frac{1}{8}$ – $\frac{1}{3}$  in. *Spikes* ovate, often compound, dense; bracteoles  $\frac{1}{3}$ – $\frac{2}{3}$  in., linear-lanceolate, toothed. Outer *sepals*  $\frac{3}{4}$  in., toothed, softly hairy, glabrous, subspinescent. *Corolla-tube* funnel-shaped in the upper half; lobes  $\frac{1}{2}$  in., ovate. *Capsule*  $\frac{2}{3}$  in., 4-seeded. *Seeds* orbicular, compressed, silky.—Uniform except as to habit and indumentum. The common Sikkim form has erect stems, leaves 4 in. long, glabrate lineolate above, outer sepals subspinous-ciliate; a common Khasia form is similar, but has the sepals very sparingly toothed; the West Himalaya form (*B. napalensis* var. *microphylla*, Nees) has leaves hardly an inch long and many solitary flowers; *B. salicifolia*, Heyne, has a diffuse weedy habit, linear-oblong leaves and much yellow hair; the South Indian plant, on hotter drier rocks, has often smaller more rigid very hairy leaves, and very hairy sepals. There can be, as T. Anderson states, no doubt that this plant is wild everywhere in the lower hills of N.E. and Central India; and no doubt in the Mts. of S. India also.

20. ***B. nutans***, Nees in *DC. Prodr.* xi. 227; leaves narrowly obovate attenuately acuminate at both ends glabrous, spikes elongate pubescent, bracts and bracteoles small lanceolate, sepals lanceolate minutely pubescent, corolla 1 in. blueish purple. T. Anders. in *Thwaites Enum.* 230, and in *Journ. Linn. Soc.* ix. 493; *Bedd. Ic. Pl. Ind. Or.* t. 264.

CEYLON, alt. 1–3000 ft.; Gardner, Champion, &c.

An undershrub. *Leaves* 8 by  $1\frac{3}{4}$  in., lineolate above; petiole  $\frac{1}{4}$ – $1\frac{1}{4}$  in. *Spikes* 1–5 in., often nodding, dense with flowers; bracts and bracteoles  $\frac{1}{8}$ – $\frac{1}{4}$  in. Outer *sepals* nearly  $\frac{1}{2}$  in., nervose, one divided  $\frac{1}{3}$  the way down into 2 narrow-lanceolate teeth. *Corolla* nearly glabrous, deep blue-purple; tube funnel-shaped upwards; lobes  $\frac{1}{3}$  in., ovate. *Capsule*  $\frac{3}{4}$ –1 in., 4-seeded. *Seeds*  $\frac{1}{4}$  in. diam., silky.



21. **B. courtallica**, *Nees in DC. Prodr.* xi. 226; leaves narrowly obovate or elliptic attenuately acuminate at both ends glabrous, spikes elongate pubescent, bracts and bracteoles small linear-lanceolate, sepals elliptic acuminate very pubescent, corolla  $1\frac{1}{2}$ –2 in. *Dalz. & Gibs. Bomb. Fl.* 188; *Wight Ic.* t. 1529; *T. Anders. in Journ. Linn. Soc.* ix. 493. *B. inæqualis*, *Benth. in Flora* 1849, 577.

W. DECCAN PENINSULA; from the Concan to Courtallum, *Wight*, &c.

A large shrub (*Wight*). *Spikes* 1–3 in., dense; bracts  $\frac{1}{4}$  in.; bracteoles  $\frac{1}{4}$ – $\frac{1}{2}$  in. Outer *sepals*  $\frac{3}{4}$  by  $\frac{1}{4}$  in., nervose, subcorolloid, much more pubescent than in *B. nutans*. *Corolla* blue and yellow (*Dalzell*), white (*Ritchie*). *Capsule* and *seeds* as in *B. nutans*.—Closely allied to *B. nutans*, differing in the broader sepals and larger flowers.

\*\*\* *Bracteoles* 2, lanceolate or elliptic, often nearly as long as the calyx.

22. **B. conspicua**, *Nees in Wall. Pl. As. Rar.* iii. 92, and in *DC. Prodr.* xi. 226; leaves elongate-oblong acuminate at both ends, spikes linear-oblong somewhat yellow-strigose, bracteoles linear-oblong as long as the calyx, corolla 1 in. *T. Anders. in Journ. Linn. Soc.* ix. 493. *Justicia conspicua*, *Wall. Cat.* 2460.

PENANG; *Wallich*.

*Leaves* 8 by 2 in., lineolate above, somewhat yellow-strigose on the nerves beneath; petiole  $\frac{3}{4}$  in. *Spikes* 4 in., terminal, erect, somewhat lax; bracts  $\frac{3}{4}$  by  $\frac{1}{2}$  in., spatulate-oblong; bracteoles  $\frac{3}{4}$  by  $\frac{1}{2}$  in. Outer *sepals*  $\frac{2}{3}$  in., lanceolate, acute, yellow-hairy, one bifid at the apex. *Capsule*  $\frac{3}{4}$  in., narrowly ellipsoid, acute at both ends, glabrate, 4-seeded. *Seeds* ultimately nearly glabrous except near the base.

23. **B. Stocksii**, *T. Anders. in Journ. Linn. Soc.* ix. 493; leaves subsessile elliptic acute shining nearly glabrous, flowers solitary axillary, bracteoles narrowly oblong hispid-ciliate as long as the calyx, capsule 2-seeded.

BOMBAY; Bababoodun Hills, *Stocks*.

A small undershrub; branches erect, sparsely hispid. *Leaves*  $2\frac{1}{4}$  by 1 in., base rounded, glabrous or slightly hispid-ciliate; petiole  $0\text{--}\frac{1}{8}$  in. *Bracteoles* 1 by  $\frac{1}{2}$  in., subobtus. *Sepals* 1 in., subentire, hispid-ciliate, 2 outer lanceolate, one bifid  $\frac{1}{3}$  the way down into narrow lanceolate segments. *Corolla* not seen. *Capsule*  $\frac{3}{4}$  in., shortly obovoid compressed rostrate. *Seeds* nearly  $\frac{1}{2}$  in. diam., silky, occupying the middle of the capsule.—*T. Anderson*, from the habit and leaves of this plant, evidently considered it allied to *B. montana*. The capsule is narrowed towards the base, or it might be arranged in the section *Prionitis*. It is really a very marked species, almost worthy a section to itself.

24. **B. strigosa**, *Willd. Sp. Pl.* iii. 379; leaves large ovate acute long-decurrent on the petiole glabrate above, spikes dense many-fld. 1-sided, bracteoles oblong or elliptic shorter than the calyx, outer sepals ovate ciliate-denticulate minutely strigose, corolla  $1\frac{1}{2}$ –2 in. blue. *Heyne in Herb. Rottler.* *B. cærulea*, *Roxb. Hort. Beng.* 45, and *Fl. Ind.* iii. 39; *Wall. Cat.* 2509; *Nees in Wall. Pl. As. Rar.* iii. 91, and in *DC. Prodr.* xi. 226; *T. Anders. in Journ. Linn. Soc.* ix. 491. *B. macrophylla*, *Heyne in Herb. Rottler.* *Pseudobarleria cærulea*, *Oerst. in Vidensk. Meddel. Kjob.* 1854, 135.

BENGAL, in the lower hills, alt. 0–4000 ft., common; ORISSA, CHOTA NAGPORE, SIKKIM, ASSAM.—DISTRIB. Much cultivated in India and Malaya.

Shrubby, 2–4 ft.; branches fulvous-strigose upwards. *Leaves*  $5\frac{1}{2}$  by  $2\frac{1}{2}$  in. (sometimes twice as large), widest towards the base, lineolate above, fulvous-strigose on the nerves beneath; petiole  $\frac{1}{2}$ –1 in., or 0, i. e. subulate by the much decurrent leaf-base.



Spikes 1-3 in., very dense, often glomerate, always secund, the sepals densely imbricated, the bracteoles appearing patent or reflexed on one side; bracteoles  $\frac{1}{3}$ - $\frac{2}{3}$  in., lanceolate or subovate. Outer sepals 1 in., sometimes more, nervose. Corolla funnel-shaped in the upper half of the tube; lobes  $\frac{2}{3}$  in., ovate. Capsule  $\frac{3}{4}$  in., 4-seeded; seeds silky.

VAR. *polystachya*; leaves very large fulvous-hirsute above somewhat glaucescent beneath, spikes densely agglomerated yellow-hirsute. *B. polystachya*, Nees in DC. Prodr. xi. 226.—Concan; Stocks.

VAR. *terminalis*; leaves thinly fulvous-hirsute above, spikes substroilate not or very obscurely 1-sided, outer sepals more softly hairy often obtuse. *B. terminalis*, Nees in DC. Prodr. xi. 225; Dalz & Gibs. Bomb. Fl. 188.—Concan; Jacquemont, &c. Belgaum; Ritchie.—This may be a distinct species, as Dalzell considers; but T. Anderson does not deem it worth notice as a var.

25. ***B. polytricha***, Wall. Pl. As. Rar. i. 72, t. 82, and Cat. 7143; leaves large oblong attenuate at both ends hirsute above, spikes dense many-fld. 1-sided, bracteoles oblong or elliptic somewhat shorter than the calyx, outer sepals ovate ciliate-denticulate hirsute, corolla  $1\frac{1}{2}$ -2 in. blue. Nees in Wall. Pl. As. Rar. iii. 91, and in DC. Prodr. xi. 225; T. Anders. in Journ. Linn. Soc. ix. 491. *B. cærulea*, Wall. Cat. 2509, letter K only. *B. hirsuta*, Wall. Cat. 7142; Nees ll. c. *Pseudobarleria polytricha*, Oerst. in Vidensk. Meddel. Kjob. 1854, 135.

CHITTAGONG, PEGU and TENASSERIM; Wallich, &c., frequent.—DISTRIB. Ava.

Leaves 6 by  $1\frac{3}{4}$  in., base gradually cuneately attenuated, hairs long on the upper surface; otherwise altogether as *B. strigosa*.

VAR. *polystachya* has the leaves suddenly narrowed to the subulate petiole. *B. hirsuta* is a young state, having the heads substrobiliform, not (or very obscurely) 1-sided; probably always more or less 1-sided in fruit.

26. ***B. nitida***, Nees in Wall. Pl. As. Rar. iii. 91, and in DC. Prodr. xi. 224; leaves ovate or elliptic shortly acuminate at both ends lineolate nearly glabrous above, spikes dense 1-sided, bracteoles elliptic or subovate nearly as long as the calyx, outer sepals ovate strongly ciliate-denticulate shining sparsely hispidulous not strigose, corolla  $1\frac{1}{2}$  in. blue. Wight Ic. t. 454; T. Anders. in Journ. Linn. Soc. ix. 491. *B. cærulea*, Wall. Cat. 2509, letter H only. *B. bracteata*, Heyne in Herb. Rottler.

Hills of S. DECCAN PENINSULA; Rottler; Courtallum, Wight; Nilghiries. Foulkes; Tinnevely Hills, Beddome.

Leaves  $1\frac{1}{2}$ -2 in. Outer sepals shining, with scattered yellow hairs, but no strigose pubescence on the nerves without; otherwise as *B. strigosa*, from which T. Anderson admits it to be specifically distinct. The Simla plant referred to this species by Nees is *B. strigosa*, with (as usual in the N.W. Himalaya) smaller leaves than in the Sikkim Terai form.

### XXIII. **NEURACANTHUS**, Nees.

Perennials; flowering stems erect, annual. Leaves entire. Flowers small, blue, spicate; spikes axillary or terminal, elongate strobilate or dense capitate; bracts ovate, membranous or coriaceous; bracteoles 0 or minute. Calyx 2-partite; posterior segment 3-toothed, anterior 2-toothed or 2-partite. Corolla tubular, upper half wide-funnel-shaped; limb subentire or obscurely lobed, plicate. Stamens 4, didynamous; anterior anthers 2-lobed, posterior 1-lobed (second lobe rudimentary); lobes ovoid, distinct, sometimes hairy. Style at the apex 2-branched, 1 branch linear-lanceolate, the other obsolete; ovary 4-ovulate. Capsule oblong, glabrous, 4-seeded. Seeds much compressed, ovate, densely inelastically silky.—Species 6, the 5 following and a tropical African one.



*Lepidagathis* differs by the anthers all 2-celled, the stigma subequally minutely 2-lobed, and the presence of bracteoles. *N. subuninervius*, Kurz, has been removed to *Lepidagathis*.

\* *Spikes axillary, elongate, bracts sub-4-ranked.*

1. ***N. trinervius***, *Wight Ic.* t. 1532; leaves sessile elliptic cuneate at both ends nearly glabrous, bracts ovate or obovate spinous-mucronate 5-nerved, calyx-segments linear-lanceolate long-ciliate. *Dalz. & Gibs. Bomb. Fl.* 190; *T. Anders. in Journ. Linn. Soc.* ix. 494.

CONCAN; in the Ghauts, *Law, Dalzell, &c.*; Salsette, *Herb. Wight*.

*Stems* 1–3 ft., glabrous except at the tips. *Leaves*  $4\frac{1}{2}$  by  $1\frac{3}{4}$  in., lineolate above, sometimes minutely setose. *Spikes* 1–5 in., hairy; bracts  $\frac{1}{3}$  by  $\frac{1}{6}$  in. *Calyx*  $\frac{1}{4}$  in.; segments divided about half-way down; cilia  $\frac{1}{8}$  in., rising from minute glistening tubercles. *Corolla*  $\frac{1}{2}$  in., blue, nearly glabrous without, 2-lipped; segments 5, sub-similar, obtusely triangular, plicate in bud, tips tufted. *Capsule*  $\frac{1}{4}$  in. *Seeds*  $\frac{1}{10}$  in.

2. ***N. tetragonostachyus***, *Nees in Wall. Pl. As. Rar.* iii. 97, and *Cat.* 7168, and in *DC. Prodr.* xi. 248; leaves short-petioled elliptic or obovate-lanceolate attenuate at both ends thinly pubescent or glabrous, bracts elliptic spinous-mucronate 5-nerved, calyx-segments linear-lanceolate long-ciliate. *T. Anders. in Journ. Linn. Soc.* ix. 494.

PEGU; Prome Hills, *Wallich*; Rangoon, *M' Lelland*; Moulmein, *Parish*.

Hardly differs from *N. trinervius* except in the greater attenuation of the leaves at both ends. *Flowers* blue (*Parish*).

3. ***N. grandiflorus***, *Kurz in Journ. As. Soc.* 1873, pt. ii. 95; leaves small obovate or oblong subobtuse nearly glabrous, bracts ovate-lanceolate rigid 5-nerved, calyx-segments lanceolate long-ciliate.

PEGU; Prome, *Kurz*.

*Leaves*  $1\frac{1}{2}$  by  $\frac{3}{4}$  in., not lineolate, minute scabrid-pubescent (in Kurz's specimen); petiole obsolete. *Corolla*  $\frac{1}{2}$  in., or rather more, blue.—Exceedingly near *N. tetragonostachyus*, but has much smaller leaves, and larger flowers. *Neuracanthus* sp. (*Kew Distrib. n.* 6144), collected by Griffith in Hookhoom Valley, Upper Burma, is perhaps a variety, but has the leaves closely pubescent beneath.

\*\* *Spikes axillary, densely capitate, bracts not 4-ranked.*

4. ***N. sphærostachyus***, *Dalz. in Hook. Kew Journ.* ii. 140; leaves subsessile elliptic nearly glabrous, bracts ovate softly white-hairy, calyx-segments lanceolate or subovate subobtuse. *Dalz. & Gibs. Bomb. Fl.* 190; *Hook. Ic. Pl.* t. 835. *N. Lawii*, *Wight Ic.* t. 1531; *T. Anders. in Journ. Linn. Soc.* ix. 494. *Lepidagathis sphærostachya*, *Nees in DC. Prodr.* xi. 254.

CONCAN; *Dalzell, &c.*; common in Bombay Island.

*Stems* 1–2 ft. *Leaves*  $4\frac{1}{2}$  by 2 in., obtuse or subacute, lineolate above; petiole scarcely  $\frac{1}{8}$  in. *Spikes* 1–2 in., sometimes agglomerated into axillary globes 3–4 in. diam.; bracts  $\frac{1}{2}$  in., purplish. *Calyx*  $\frac{1}{3}$  in., one lobe shortly 3-toothed, the other deeply 2-fid. *Corolla*  $\frac{2}{3}$  in.; limb a fine blue, obconic, subentire, plicate; lower lip of 3 very depressed triangular lobes, upper an emarginate subsimilar lobe. *Anthers* pubescent. *Capsule*  $\frac{2}{3}$  in., 4-seeded. *Seeds*  $\frac{1}{3}$  in. diam.—The plant appears rarely to seed, as Dalzell notes.

\*\*\* *Spikes terminal, oblong.*

5. ***N. Neesianus***, *Clarke*; hoary silky subtomentose, leaves sessile



ovate or broadly elliptic base cuneate. *Lepidagathis* Neesianus, *Wight*; *T. Anders. in Journ. Linn. Soc.* ix. 499.

MADRAS; Paloor (in Arcot) on black cotton-soil, *Wight*.

*Stems* 12–18 in., procumbent, terete, softly hairy. *Leaves* 2 by 1 in., obtuse, entire, silky on both surfaces, young white-tomentose beneath. *Spikes* 2 by  $\frac{2}{3}$  in., dense; bracts  $\frac{1}{2}$  in., ovate, acute, obscurely 4-ranked; bracteoles small, subulate. *Calyx* 2-partite; one segment 3-lobed less than half-way down, lobes lanceolate acute; the other 2-lobed nearly to the base. *Corolla* 2-lipped; upper lip ovate minutely bifid, lower 3-partite, lobes ovate mucronate. *Stamens* 4, included; the upper anthers 2 with 2 divaricate cells, lower 1-celled; connective hairy. *Capsule*  $\frac{1}{3}$  in., oblong, 4-seeded. *Seeds* compressed, hairy.—Flowers or stamens described by T. Anderson, whose account of the stamens requires the species to be transferred from *Lepidagathis* to *Neuracanthus*, as does also the structure of the calyx, which is erroneously given by T. Anderson. Wight has written on his original ticket “Paloor, in black cotton soil,” which T. Anderson has taken to be Palamcottah (near Tinnevely), where it is believed there is no black cotton-soil.

#### XXIV. **CROSSANDRA**, *Salisb.*

Undershrubs. *Leaves* entire or undulate, subdentate. *Spikes* linear-oblong; bracts imbricate; bracteoles linear; flowers sessile, yellow. *Sepals* 5, ovate, acute, 2 inner much smaller. *Corolla-tube* linear, incurved; limb on one side of 5 subequal, elliptic lobes, imbricate in the bud. *Stamens* 4, didynamous; anthers 1-celled, muticous; connective mucronate. *Style* minutely 2-lobed at the tip; ovary 4-ovulate. *Capsule* oblong, acute, 4-seeded. *Seeds* compressed, orbicular, adpressedly scaly; scales of numerous hairs coalescing nearly to their tips, which are seen imperfectly free when moistened.—Species 5; 1 in India, 4 in Tropical Africa or Madagascar.

**C. undulæfolia**, *Salisb. Par. Lond.* t. 12; leaves ovate or lanceolate narrowed at both ends, spikes sessile or peduncled pubescent. *Bot. Reg.* t. 69; *Bot. Mag.* t. 2186. *C. axillaris*, *Nees in Wall. Pl. As. Rar.* iii. 98, and in *DC. Prodr.* xi. 281; *Wight Ill.* t. 164 b, fig. 7, and  *Ic.* t. 460; *Dalz. & Gibs. Bomb. Fl.* 193. *C. infundibuliformis*, *Nees in Wall. Pl. As. Rar.* iii. 98, and in *DC. l. c.* 280; *Wight Ic.* t. 461; *T. Anders. in Journ. Linn. Soc.* ix. 494. *C. oppositifolia*, *Nees in Wall. Pl. As. Rar.* iii. 98, and in *DC. l. c.* 281. *C. coccinea*, *Dalz. & Gibs. Bomb. Fl. Suppl.* 71. *Justicia infundibuliformis*, *Linn.*; *Burm. Fl. Ind.* 7. *Harrachia speciosa*, *Jacq. Ecl.* 33, t. 21; *Blume Bijl.* 793. *Ruellia infundibuliformis*, *Roxb. Fl. Ind.* iii. 41; *Wall. Cat.* 2364.—*Rheede Hort. Mal.* ix. t. 62.

DECCAN PENINSULA and CEYLON.—DISTRIB. Cult. in N. India, the Malay Peninsula and Islands.

*Stems* 1–3 ft., pubescent upwards. *Leaves* 4 by  $1\frac{1}{2}$  in. (often much smaller), glabrous or pubescent beneath; petiole  $\frac{1}{4}$ –1 in. *Peduncles* 0–5 in.; spikes 1–4 in.; bracts  $\frac{1}{2}$  by  $\frac{1}{3}$  in., elliptic, acute; bracteoles  $\frac{1}{3}$  in. *Sepals* much imbricated, outer  $\frac{1}{3}$  in., rigid, subscarious. *Corolla* glabrous; tube  $\frac{3}{4}$  by  $\frac{1}{2}$  in.; lobes  $\frac{1}{2}$  by  $\frac{1}{4}$  in. *Capsule*  $\frac{1}{3}$  in., glabrous.—Wallich's and Griffith's Nepal and Sikkim specimens, treated as wild by Nees and T. Anderson, are no doubt cultivated ones.

#### XXV. **ASYSTASIA**, *Blume.*

Herbs or undershrubs. *Leaves* entire. *Spikes* or *racemes* lax or dense, simple or compound, 1-sided or suberect; bracts and bracteoles linear, shorter than the calyx (except in *A. Lawiana*); flowers opposite or alter-



nate, usually solitary, blue purple rose or yellow. *Sepals* narrow. *Corolla-tube* short or long, funnel-shaped ventricose or narrow; lobes 5, subequal, imbricate in bud. *Stamens* 4, all perfect, didynamous, subequal; anthers oblong, cells parallel, approximate, base minutely spurred or submuticous, the points only obscurely whitened. *Ovary* 4-ovulate, very hairy; stigma minutely bifid or subcapitate. *Capsule* elliptic, 4-seeded, base contracted solid. *Seeds* compressed, orbicular or irregularly angular, rugose or tubercular, glabrous.—Species 15, Tropical Asiatic and S. African.

The species having only 2 fertile stamens are transferred to *Eranthemum*, and those with large bracts to *Lepidagathis*. It might be better to sink *Asystasia* in *Eranthemum*, for many of the species have a long narrow corolla-tube as in *Eranthemum*, and the character of the stamens appears of rather less value than in separating *Hemiadelphis* from *Hygrophila*.

\* *Corolla tubular-ventricose*, about  $\frac{3}{4}$ – $1\frac{1}{4}$  in. long.

1. **A. intrusa**, *Blume Bijl.* 796, not of *Nees*; leaves ovate or elliptic acuminate puberulous above, calyx subsessile glabrous or minutely ciliate, corolla  $\frac{3}{4}$ –1 in. tube exceedingly slender. *A. Blumei*, *Nees in DC. Prodr.* xi. 167. *A. nemorum*, *Nees in Wall. Pl. As. Rar.* iii. 90, as to descr. and Malay material.

SINGAPORE; *Schomburgk*.—DISTRIB. Java.

*Stems* 1 foot, dichotomous, slender, nearly glabrous. *Leaves* 2 by  $\frac{3}{4}$  in., base cuneate or rhomboid, undulate, subcrenate, dotted with most minute hairs above, glabrous beneath; nerves 5–6 pair; petiole  $\frac{1}{4}$  in. *Spikes* 1–2 in., slender; flowers mostly opposite; bracts scarcely  $\frac{1}{20}$  in.; lowest pedicels subobsolete. *Calyx*  $\frac{1}{6}$  in.; segments linear-lanceolate, glabrous on the back. *Corolla* glabrous; tube hardly  $\frac{1}{2}$  in. diam.; limb hardly  $\frac{1}{2}$  in. in expanse. *Stamens* 4, nearly equal. *Style* nearly glabrous; stigma subcapitate. *Capsule*  $\frac{1}{2}$  in., 4-seeded, minutely hairy.—This differs from *A. coromandeliana* (and its allies) in the very slender corolla; the tube is widened only near its apex, and is there scarcely  $\frac{1}{6}$  in. broad.

2. **A. coromandeliana**, *Nees in Wall. Pl. As. Rar.* iii. 89, and in *DC. Prodr.* xi. 165; grey puberulous, leaves ovate acute some rounded or suddenly narrowed at base, lower pedicels manifest, corolla 1– $1\frac{1}{4}$  in. inflated part of the tube much longer than its cylindric base. *Dalz. & Gibs. Bomb. Fl.* 186. *A. plumbaginea*, *Nees in Wall. Pl. As. Rar.* iii. 89, and in *DC. Prodr.* xi. 164. *A. gangetica*, *T. Anders. in Thwaites Enum.* 235. *A. violacea*, *Bot. Mag.* t. 5882. *Justicia Gangetica*, *Linn. Amœn. Acad.* iv. 299. *J. plumbaginea*, *Wall. Cat.* 2487. *Ruellia secunda*, *Vahl Symb.* iii. 84; *Wall. Cat.* 2401. *R. Digitalis*, *Koen.*; *Spreng. Syst.* ii. 825; *Nees l. c.* xi. 153. *R. zeylanica*, *Koen.*; *Roxb. Fl. Ind.* iii. 42. *R. Coromandeliana*, *Wall. Cat.* 2399, partly.—*Rheede Hort. Mal.* ix. t. 45.

DECCAN PENINSULA and CEYLON, common.—DISTRIB. Malaya, Africa, Arabia.

*A* procumbent, perennial weed, 1–2 ft., usually dusky pubescent. *Leaves* 1– $1\frac{1}{2}$  in., lower mostly subcordate, base rounded or suddenly narrowed; nerves 5–6 pair; petiole  $\frac{1}{3}$  in. *Racemes* 2–5 in., lax; lower pedicels often attaining  $\frac{1}{6}$  in.; bract and bracteoles at the base of the pedicel, about  $\frac{1}{2}$  in. *Sepals*  $\frac{1}{3}$  in., linear-lanceolate, puberulous or pubescent on the back. *Corolla* pubescent; tube yellow, limb pink or pale purple, usually dull or lurid, sometimes yellow altogether. *Filaments* with few small hairs. *Style* glabrous except near the base. *Capsule* 1 in., pubescent; solid cylindric compressed base  $\frac{1}{3}$  in. *Seeds*  $\frac{1}{3}$  in. diam., much compressed, ovoid angular wrinkled or subtubercular glabrous.

3. **A. chelonoides**, *Nees in Wall. Pl. As. Rar.* iii. 89, and in *DC. Prodr.* xi. 164; leaves elliptic narrowed at both ends minutely hairy or



glabrate, racemes compound many-fld., lower pedicels longer than the pubescent calyx, corolla  $\frac{2}{3}$ – $\frac{3}{4}$  in. purple. *T. Anders. in Thwaites Enum.* 236.

CEYLON; *Walker, Thwaites, &c.* TRAVANCORE and TINNEVELLY HILLS; *Beddome* (wild).—DISTRIB. Cultivated in S. India and Malabar.

*Leaves*  $5\frac{1}{2}$  by  $1\frac{3}{4}$  in., lower all cuneate or acuminate at the base, punctate or puberulous or with scattered hairs (without the dull grey pubescence of *A. coromandeliana*); nerves 6–8 pair. *Racemes* usually paniced, often peduncled, sometimes 50–60-fld.; lower pedicels  $\frac{1}{3}$ – $\frac{1}{2}$  in. *Capsule* nearly of *A. coromandeliana*.—Described from Nees' type specimen marked *A. chelonoides*, Var. *a*, in Nees' hand. It is the species with numerous small purple flowers much cultivated in S. India; and Col. Beddome believes it to be wild in S. Malabar, but there are no specimens except from Ceylon.

VAR. *amœna*; more hairy, leaves hairy on both surfaces, sepals subhirsute, corolla as of *A. chelonoides*, type.—Arracan; forests near Akyab, *Kurz*.

VAR. *quadrangularis*; stem acutely quadrangular, leaves ovate or narrowly lanceolate glabrate, corolla small as of *A. chelonoides*, type. *A. coromandeliana*, Var. *variabilis*, *Nees in DC Prodr.* xi. 165. *A. nemorum*, Var. *B*, *T. Anders. in Journ. Linn. Soc.* ix. 525. *Ruellia quadrangularis*, *Heyne in Herb. Rottler*.—Wynaad; *Rottler*. Anamallays; *Bedd.* Ceylon; *Macrae, Thwaites*.—Leaves very variable; in *Macrae's* example 1 by  $\frac{2}{3}$  in., in *Beddome's* 7 by 1 in., in *Thwaites's*  $2\frac{1}{2}$  by  $\frac{1}{2}$  in.

4. ***A. violacea***, *Dalz. ms., not in Hook. Kew Journ.* ii. 139; leaves large subovate lower narrowed at base, lower pedicels shorter than the hairy calyx, corolla  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. fine blue. *A. chelonoides*, *Nees in DC. Prodr.* xi. 164, Var. *β only*; *T. Anders. in Journ. Linn. Soc.* ix. 525, chiefly. *A. nemorum*, *Nees in Wall. Pl. As. Rar.* iii. 90, and in *DC. Prodr.* xi. 167 (except the Nilgiri material). *A. coromandeliana*, *Bot. Mag.* t. 4248. *Ruellia filiformis*, *Heyne in Herb. Rottler*. *R. coromandeliana*, *Wall. Cat.* 2399, type sheet partly.

W. DECCAN PENINSULA, alt. 2–6000 ft., frequent; *Rottler, &c.*

*Leaves* often  $6\frac{1}{2}$  by  $2\frac{3}{4}$  in., membranous, green, sparsely pubescent or glabrate. *Calyx-segments* nearly  $\frac{1}{3}$  in., narrowly oblong, acute. *Capsule* 1– $1\frac{1}{4}$  in.—Described from specimens named by himself, which are identical with *Wight's Herb. Propr.* n. 1952. In his original description *Dalzell* says the flowers of *A. violacea* are about half as large as those of *A. coromandeliana*, and the description appears to belong altogether to *A. chelonoides*, *Nees' type*; but in *Dalz. & Gibs. Bomb. Fl.* 186 the character of *A. violacea* is at once shortened and widened.

5. ***A. crispata***, *Benth. in Linnæa* 1851, 647; leaves elliptic or oblong acuminate lower narrowed into the petiole repand crispately crenulate glabrate, lower pedicels shorter than the pubescent calyx, corolla 1 in. white with rose or dark purple dots in the palate. *T. Anders. in Journ. Linn. Soc.* ix. 526. *A. nemorum*, *Nees in Wall. Pl. As. Rar.* iii. 90, and in *DC. Prodr.* xi. 167, as to the Nilgiri material; *T. Anders. in Journ. Linn. Soc.* ix. 524. *A. coromandeliana*, *Wight Ic.* t. 1506, not of *Nees*. *Ruellia chelonoides*, *Wall. Cat.* 2335 chiefly, not *Asystasia chelonoides*, *Nees*.

MTS. of S. DECCAN PENINSULA, alt. 4–8000 ft.; *Rottler, Wight, &c.*, common about Ooty.

*Leaves* very variable in width, nearly always crisped subcrenulate; upper often sessile, with base rounded. *Flowers* very constant in colour. *Capsule* as of *A. coromandeliana*.—This species (as also *A. chelonoides*) is so closely allied to *A. coromandeliana* that Col. Beddome says he can hardly distinguish them but by the colour of the flower. They sort out pretty well in the Herbarium, and among the large non-Indian material there is nothing like *A. chelonoides* or *crispata*.

6. ***A. travancorica***, *Bedd. Ic. Pl. Ind. Or.* t. 178; leaves elongate-



lanceolate sparingly pubescent, lower pedicels often longer than the calyx, corolla  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. purple-violet (or in cultivation white).

TRAVANCORE, S. TINNEVELLY and ANAMALLAYS, alt. 3000 ft.; *Beddome*.

A large shrub, 6–8 ft. high; branches pubescent upwards. *Leaves* 4–5 by  $\frac{2}{3}$ – $1\frac{1}{4}$  in., base cuneate or rhomboid; nerves 7–9 pair, very oblique; petiole  $\frac{1}{4}$ – $\frac{1}{2}$  in. *Racemes* 2–8 in., pubescent; lower pedicels sometimes  $\frac{1}{2}$  in. *Capsule* 1 in., nearly as of *A. coromandeliana*.—Closely allied to *A. coromandeliana*, though the elongate oblique-nerved leaves give it a very different aspect.

7. **A. macrocarpa**, *Nees in Wall. Pl. As. Rar.* iii. 89, and in *DC. Prodr.* xi. 163; pubescent, leaves oblong or elliptic narrowed at both ends, racemes dense or elongate very pubescent, corolla  $1\frac{1}{4}$  in. dull pink, cylindric base of its tube much shorter than the ventricose part. *T. Anders. in Journ. Linn. Soc.* ix. 525. *Ruellia macrocarpa*, *Wall. Cat.* 2348.—*Acanthacea*, *Griff. Itin. Notes*, 106, n. 92, and *Id. Pl. As.* t. 438.

SUBTROPICAL HIMALAYA, from Kumaon to Bhotan; in the Terai, alt. 1000 ft., and in the hotter valleys ascending to 4000 ft.

A diffuse, rambling undershrub, 1–4 ft. *Leaves*  $4\frac{1}{2}$  by  $1\frac{3}{4}$  in.; nerves 8 pair; petiole  $\frac{1}{3}$  in. *Racemes* usually condensed, 1-sided; sometimes 3–4 in., erect, lax, with opposite flowers; lower pedicels  $0\frac{1}{6}$  in.; bracts  $\frac{1}{8}$  in. *Sepals*  $\frac{1}{4}$  in., linear-lanceolate, pubescent. *Corolla* pubescent. *Stamens* 4, perfect; anther-cells distinctly spurred at the base. *Capsule*  $1\frac{1}{2}$  in., pubescent; cylindric base  $\frac{2}{3}$  in. *Seeds*  $\frac{1}{4}$  in. diam., much compressed, tubercular, rugose, glabrous.

8. **A. lanceolata**, *T. Anders. in Journ. Linn. Soc.* ix. 524; leaves lanceolate acuminate glabrous, bracts lanceolate acute villous as long as the calyx, corolla 1 in. funnel-shaped constricted base of the tube short.

BURMA; Baragyn, *Brandis (T. Anderson)*.

An-erect, glabrous herb; stem terete, sparingly branched, internodes long. *Leaves* 4–6 by  $1\frac{1}{2}$  in., undulate; petiole short. *Spikes* terminal, erect; bracts opposite,  $\frac{1}{3}$  in., subherbaceous, lax, decussate, somewhat remote; flowers sessile, 1 or 2 in the axil of each bract. *Sepals* linear, equal, villous, membranous. *Corolla* villous without; lobes 5, unequal, small, erect. *Anther-cells* 2, bases mucronate.—Not seen.

VAR. ? *Beddomei*; leaves linear-lanceolate hairy on both surfaces, corolla  $1\frac{1}{2}$  in. and upwards before expansion.—Tenasserim, Mooleyit, *Beddome*.—*Leaves* 8 by  $\frac{3}{4}$ –1 in., caudate-acuminate, widest close to the rounded or subcordate base; petiole  $0\frac{1}{10}$  in. *Spikes* compound, most of the lower bracts and calyces small without flowers; upper bracts  $\frac{1}{4}$ – $\frac{1}{3}$  in., lanceolate, glabrate. *Corolla* broad, nearly straight, urn-shaped on a short cylindric base; lobes subequal,  $\frac{1}{3}$  in., ovate, obtuse. *Stamens* 4, 2 conspicuously longer; anthers 2-celled, cells broadly oblong, parallel, equal, white-apiculate at base. *Pistil* as of *Asystasia*. *Capsule* not seen.

\*\* *Corolla* linear shortly funnel-shaped upwards about 2 in. long.

9. **A. atroviridis**, *T. Anders. in Journ. Linn. Soc.* ix. 526; leaves large elliptic acuminate at both ends nearly glabrous, racemes condensed nearly glabrous, corolla 2 in. rose-pink tube very long linear. *Ruellia atroviridis*, *Wall. Cat.* 2404.—*Asystasia* sp. n. 15, *Herb. Ind. Or. H. f. & T. Verbenacearum* sp., *Nees in DC. Prodr.* xi. 155.

KHASIA MTS., alt. 0–3000 ft., frequent; *Wallich, Griffith, H. f. & T., &c.*

*Stems* 1–3 ft., herbaceous. *Leaves*  $8\frac{1}{2}$  by  $3\frac{1}{4}$  in.; nerves 10–14 pair; petiole  $1\frac{1}{2}$  in. *Racemes* usually paniculate in a dense terminal subsessile head; bracts  $\frac{1}{2}$  in.; pedicels  $\frac{1}{8}$  in., often pubescent. *Sepals*  $\frac{1}{2}$  in., sublinear, glabrous or pubescent. *Corolla* glabrous, linear portion of the tube  $1\frac{1}{4}$  in., limb about 1 in. diam. *Stamens* 4, glabrous; anthers muticous, or very obscurely mucronate at the base. *Capsule*



1½ in., with the seeds nearly as of *A. macrocarpa*.—The name is very misleading; the corolla is always a fine rose. In one example the raceme is developed into a lax very compound panicle, and the plant is noted as 6 ft. high.

10. **A. Neesiana**, *Nees in Wall. Pl. As. Rar.* iii. 89, and in *DC. Prodr.* xi. 164; leaves large broadly elliptic acute sparingly pubescent, racemes elongate very lax pubescent, corolla 2 in. pink tube very long linear. *T. Anders. in Journ. Linn. Soc.* ix. 526. *Ruellia Neesiana*, *Wall. Pl. As. Rar.* i. 73, t. 83, and *Cat.* 2342.—*Asystasia* sp. n. 14, *Herb. Ind. Or. H. f. & T.*

KHASIA MTS., alt. 0–3000 ft., frequent; *Wallich, &c.* CACHAR; *Keenan*. MOULMEIN; *Parish*.

*Leaves* 8 by 3 in., lower long-petioled, uppermost pair usually (not always) sessile. *Raceme* often nearly a foot long, very pubescent. *Corolla, capsule and seeds* nearly as of *A. atroviridis*. *Anther-cells* minutely mucronate at the base.

#### DOUBTFUL SPECIES.

11. **A. ? KUNTHIANA**, *Nees in Wall. Pl. As. Rar.* iii. 89, and in *DC. Prodr.* xi. 163; leaves oblong or elliptic acuminate at both ends pubescent beneath, spikes dense few-fl. on very short axillary peduncles. *T. Anders. in Journ. Linn. Soc.* ix. 525. *Ruellia Kunthiana*, *Wall. Cat.* 2419.

PENANG; *Wallich*.

*Stems* creeping, rooting; branches 1 foot, erect, subterete, glabrous. *Leaves* 3½ by 1½ in., lineolate above; petiole scarcely ¼ in. *Peduncles* 0–½ in.; spikes ¼–½ in., glabrous, lineolate; bracts ⅙ in. *Sepals* ¼ in., linear. *Capsule* ½ in., constricted for a short space at the base, 4-seeded, glabrous. *Flowers* not seen.—*T. Anderson* does not doubt this being an *Asystasia*, but it might quite as well be a *Justicia*.

12. **A. ? Eranthemum montanum**, *Bot. Mag.* t. 4031, *not of Roxb.*; leaves elliptic acuminate at both ends glabrate, racemes lax compound puberulous, sepals linear-subulate ciliate, corolla 2½ in. purple tube very long linear.

“INDIA;” cultivated formerly at Kew.—Upper *leaves* 4½ by 1½ in.; nerves 7 pair; petiole ½ in. *Peduncle* 3 in., grey puberulous; panicle lax; bracts ⅙–½ in., linear-lanceolate, much shorter than the calyx; lower pedicels 0–½ in. *Sepals* ½ in. *Corolla* glabrous. *Stamens* 4 perfect, subsimilar, glabrous; anther-cells 2, bases acute. *Stigma* minutely equally bifid.—A plant of which nothing is known, but the excellent figure cited, and the specimen from which it was taken. The description is incorrect as to the 2 stamens, of which there are 4, hardly at all didynamous. The minute bracts are as in *Asystasia*, and will not do for *Dædalacanthus*. Its true place is, in the absence of fruit, uncertain.

13. **A. LAWIANA**, *Dalz. in 'Hook. Kew Journ.* iv. 344; leaves elliptic acute at both ends very sparsely hairy, spikes short-oblong dense softly-hairy, bracts large imbricated, corolla ½–¾ in. white. *Dalz. & Gibs. Bomb. Fl.* 186. *A. mysurensis*, *T. Anders. in Journ. Linn. Soc.* ix. 524. *Ruellia mysurensis*, *Roth Nov. Sp.* 303; *Wall. Cat.* 2402. *Strobilanthes mysurensis*, *Nees in Wall. Pl. As. Rar.* iii. 86, and in *DC. Prodr.* xi. 192.

W. DECCAN PENINSULA; from Saugur to Kurg, frequent; *Rottler, &c.*

*Stem* herbaceous, erect, thinly hairy. *Leaves* 4 by 1¾ in., with few distant multicellular hairs above, minutely lineolate, puberulous beneath; petiole 1½ in. *Flower-heads* 1½ by ¾ in., substrobiliform; bracts ¾–1 by ¼ in., broadly lanceolate, softly hirsute; bracteoles ⅔ in., lanceolate membranous. *Sepals* ¼ in., linear hairy. *Stamens* slightly didynamous, nearly glabrous; anthers 2-celled; cells ovate or subellipsoid, muticous, one slightly above the other. *Style* glabrous; stigma very minutely bifid; ovary pubescent. *Capsule* ¾ in., 4-seeded; solid cylindric base ½ in. *Seeds* compressed, angular; testa minutely laxly hexagonal, glabrous.—Very unlike the genus in the bracts, corolla, anthers, and habit, in which it more resembles *Strobilanthes micranthus*.



XXVI. **ERANTHEMUM**, Linn.

*Stamens* 2 fertile, 2 rudimentary or 0. *Ovary* often glabrous. Otherwise as *Asystasia*.—Species 30, tropics of both hemispheres.

*E. diantherum*, Roxb. *Fl. Ind.* i. 112, Wall. *Pl. As. Rar.* iii. 108, and *E. racemosum*, Roxb. *l. c.* 113, Wall. *l. c.* 107, DC. *Prodr.* xi. 455, came from the Moluccas.—*E. semperflorens*, Roth *Nov. Sp.* 2, Nees in DC. *Prodr.* xi. 458, came from Martinique, nor is there reason from Roth's account to believe it otherwise than cultivated by Heyne.—*Justicia* sp., Griff. *l. c.* *Pl. As.* t. 426 (Kew *Distrib.* n. 6177), is a fine *Eranthemum*, collected in Ava, outside the bounds of British India.

\* *Corolla* tubular-ventricose.

1. ***E. indicum***, Clarke; leaves lanceolate or subovate acuminate at both ends glabrous, racemes dense puberulous or glabrate, corolla  $1\frac{1}{4}$  in. white abundantly purple-veined. *Thyrsacanthus indicus*, Nees in DC. *Prodr.* ix. 325. *Asystasia thyrsacanthus*, T. Anders. in *Journ. Linn. Soc.* ix. 525.

SIKKIM and BHOTAN, alt. 1–5000 ft., frequent; *H. f. & T.*, &c. ASSAM, in the lower hills; KHASIA and JAINTEA MTS., alt. 1–4000 ft., frequent.

A diffuse undershrub, 1–4 ft. *Leaves* 7 by  $2\frac{1}{2}$  in.; nerves 5–7 pair; petiole  $\frac{1}{4}$ – $\frac{3}{4}$  in. *Racemes* 1–5 in.; lower pedicels 0– $\frac{1}{8}$  in.; bracts  $\frac{1}{8}$ – $\frac{1}{6}$  in., linear. *Sepals*  $\frac{1}{8}$  in., linear-lanceolate, glabrous or puberulous. *Corolla* distinctly 2-lipped, upper lip subentire emarginate galeate, lower 3-fid, middle lobe the widest. *Filaments* and *style* minutely hairy. *Capsule*  $1\frac{1}{3}$  in., base long, cylindric, solid. *Seeds*  $\frac{1}{4}$  in., orbicular, tubercled, rugose, glabrous.—It is difficult to give a reason why this is not a *Thyrsacanthus*, except that it is not American; the curved subgaleate corolla does not agree well either with *Asystasia* or *Eranthemum*.

\*\* *Corolla-tube* linear-cylindric, often very narrow.

2. ***E. crenulatum***, Lindl. in *Bot. Reg.* t. 879, not of Nees; leaves lanceolate or elliptic acuminate at both ends, racemes slender glabrous or puberulous, flowers solitary, corolla pale purple or lilac tube  $\frac{2}{3}$  in. slender narrowly funnel-shaped upwards, ovary glabrous.

KHASIA TERAI, alt. 0–2000 ft., frequent; Wallich, *H. f. & T.*, &c.

Perennial; 18 in., glabrous. *Leaves*  $6\frac{1}{2}$  by 2 in., undulate-crenate; nerves 8 pair; petiole  $\frac{1}{3}$  in. *Racemes* in a terminal panicle with curved drooping slender branches; bracts  $\frac{1}{8}$  in., linear-lanceolate; pedicels 0– $\frac{1}{8}$  in. *Sepals*  $\frac{1}{6}$  in., sublinear, glabrous or puberulous. *Corolla-limb* obscurely 2-lipped,  $\frac{1}{2}$  in. diam. *Stamens* 2, subincluded. *Capsule*  $\frac{3}{4}$  in.; cylindric base  $\frac{1}{3}$  in. *Seeds*  $\frac{1}{6}$  in., rugose, glabrous.—Lindley's picture is excellent, but shows a small example in young flower; the panicle is often 8–12 in. diam., the flowers becoming distant on the branches. The species has been quite lost sight of by Nees and T. Anderson, Hooker's examples having (probably from the short corolla) been referred to *Codonacanthus*.

3. ***E. malabaricum***, Clarke; leaves elliptic or ovate narrowed at both ends glabrous, spikes glabrous or puberulous, corolla white or yellowish tube  $1$ – $1\frac{1}{4}$  in., ovary glabrous. *E. crenulatum*, Wall. *Cat.* 2491; Dalz. & Gibs. *Bomb. Fl.* 195; T. Anders. in *Thwaites Enum.* 235, and in *Journ. Linn. Soc.* ix. 523, chiefly. *Justicia latifolia*, Vahl *Symb.* ii. 4?

W. DECCAN PENINSULA, frequent; Wight, Hohenacker. CEYLON; Thwaites (C. P. n. 1979).

Suffrutescent, 2 ft. high. *Leaves* 5 by  $2\frac{1}{4}$  in., undulate-crenulate, minutely lineolate on both surfaces; nerves 6–7 pair; petiole  $\frac{1}{3}$  in. *Spikes* 4–9 in.; lowest pedicels obsolete in fruit; bracts  $\frac{1}{8}$  in., linear-lanceolate. *Sepals*  $\frac{1}{6}$  in., sublinear,



glabrous or puberulous. *Corolla-tube* linear, only slightly widened close to the apex; limb 1-1½ in. diam., obscurely 2-lipped. *Capsule* ¾ in., cylindric base ½ in. *Seeds* ⅙ in., rugose, subtubercled glabrous.—Vahl's description agrees pretty well with this Malabar species, and he received his examples from Koenig; but his reference to Rheede Hort. Mal. ix. t. 44 (which has extremely different flowers) throws a doubt on the identification. Nees says his *E. crenulatum* was founded *entirely* on material from Silhet to Malacca, and therefore it should not belong to *E. malabaricum*, even in part; but in fact a good deal of Nees' material came from Malabar.

4. ***E. palatiferum***, Nees in *Wall. Pl. As. Rar.* iii. 108, and in *DC. Prodr.* xi. 457; leaves elliptic acuminate at both ends pubescent on the midrib beneath or ultimately glabrate, racemes pubescent flowers often fascicled, corolla pale-purple tube 1¼-1½ in. linear, ovary pubescent. *T. Anders. in Journ. Linn. Soc.* ix. 524. *Justicia palatifera*, *Wall. Pl. As. Rar.* i. 80, t. 92. *J. rubicunda*, *Ham. in Wall. Cat.* 2480.

SUBTROPICAL SIKKIM and BHOTAN, alt. 0-3000 ft., frequent; *Treutler, Gamble, &c.* ASSAM and KHASIA MTS., alt. 0-3000 ft., common; *Wallich, Griffith, &c.*

Perennial, 3 ft.; stems pubescent upwards. *Leaves* 7 by 2-3 in., very obscurely (or not) lineolate; nerves 8-10 pair; petiole ⅓ in. *Racemes* often one foot long, pubescent; bracts ⅙-⅙ in., sublinear; lower pedicels rarely attaining ⅙ in. *Sepals* ½ in., linear, pubescent. *Corolla-tube* linear almost to its apex; limb 1¼ in. diam., obscurely 2-lipped; purple often with a yellowish spot on the middle lobe of the lower lip. *Capsule* nearly 1 in., pubescent. *Seeds* ⅙ in. diam., reticulate-rugose, glabrous.

VAR. *levicapsa*; leaves more conspicuously lineolate on the upper surface, spikes long slender in more or less compound panicles, flowers often slenderer, capsule less pubescent usually soon glabrate. *E. crenulatum*, *Wall. Cat.* 2491, letter F.—Chittagong, alt. 0-2000 ft., frequent; *H. f. & T., &c.* Pegu, *M'Lelland*. Mergui, *Griffith*. Attran, *Wallich*.

VAR. *elata*; leaves large uppermost petioled elongate-cuneate at the base. *E. elatum*, *Kurz in Journ. Bot.* 1872, 46, and 1873, 47. *E. latifolium*, *Kurz in Flora* 1870, 363 excl. syn. ?—Pegu, Yomah, *Kurz*. Rangoon, *M'Lelland*.—Kurz notes that this species produces on the same plant dimorphous flowers; one kind as of *E. palatiferum* type, the other (usually the upper ones in the spike) about ½ in. long, which chiefly produce fruit. Similar dimorphic flowers occur in typical Khasian *E. palatiferum*.

5. ***E. album***, Nees in *DC. Prodr.* xi. 455; leaves elliptic acuminate puberulous on the midrib beneath or glabrate, spikes paniced minutely pubescent, corolla white tube 1¼ in. linear. *T. Anders. in Journ. Linn. Soc.* ix. 523. *E. crenulatum*, *Wall. Cat.* 2491, letters D, E. *Justicia alba*, *Rorb. Fl. Ind.* i. 116, and *Id. Ined. in Herb. Kew*.

ANDAMANS; *Roxburgh, Kurz*. PEGU; *Brandis*. CHITTAGONG; *J. D. H. PENANG*; *Wallich*. NICOBARS; *Kurz*.

*Stem* woody upwards, bark whiteish. Uppermost *leaves* very shortly petioled, base usually rounded, but in *Roxburgh's* picture (and in the Chittagong example) cuneate.—This, when dry, seems very difficult to separate from *E. palatiferum*, Nees, Var. *levicapsa*, except by the woodiness of the stems, almost to the panicle as shown in *Roxburgh's* picture and in *Kurz's* and *Hooker's* examples; the stems in *E. palatiferum* being distinctly herbaceous unless very near the base.

6. ***E. malaccense***, *Clarke*; leaves broad-lanceolate minutely pilose on the midrib beneath, spikes 1-3 subterminal puberulous or pubescent, corolla pale-purple tube 1-1½ in. linear, ovary nearly glabrous. *E. crenulatum*, Nees in *Wall. Pl. As. Rar.* iii. 107, and in *DC. Prodr.* xi. 453, chiefly; *T. Anders. in Journ. Linn. Soc.* ix. 523, partly (not of *Lindl.*). *E. palatiferum*, *Bot. Mag.* t. 5957, left-hand fig. only. *Justicia orbiculata*, *Wall. Cat.* 2489, letter b.

MALACCA; *Griffith* (*Kew Distrib.* n. 6175), *Cuming*, nn. 2357, 2389, &c.



An undershrub, 4 ft. high. *Leaves*  $5\frac{1}{2}$  by  $1\frac{1}{4}$  in., acuminate, base cuneate, obscurely or obsoletely lineolate; nerves 5–6 pair, much curved, usually crispedly pubescent when young; petiole  $\frac{1}{3}$  in. *Spikes* 2–5 in., fuscous-puberulous, few- or little-branched, never forming a lax panicle; bracts  $\frac{1}{8}$  in.; lower pedicels very short. *Flowers* and *fruits* very nearly as of *E. palatiferum*. Young *capsule* sometimes sparsely pilose, soon glabrous.—This plant seems plentiful at Malacca, and probably occurs in the Malay Isles, but does not exactly agree with any Malay species at Kew, nor with the descriptions of the Dutch botanists. It may (ex descr.) possibly be *E. punctatum*, *Nees in DC. Prodr.* xi. 455.

7. **E. Andersoni**, *Masters in Gard. Chron.* 1869; leaves large lanceolate acute at both ends glabrous, spike very long linear flower-clusters whorled below, bracts and calyces glabrous or puberulous, corolla-tube  $1\frac{1}{2}$ – $1\frac{3}{4}$  in. *Bot. Mag.* t. 5771. *E. elegans*, *Masters l. c.* 1868, p. 1234, not of Br. *E. Blumei*, *Teijs.*? *Miq. Fl. Ind. Bat.* ii. 836; *T. Anders. Journ. Linn. Soc.* ix. 523; *Kurz in Flora* 1870, 363.

SINGAPORE; *T. Anderson*.—DISTRIB. Malaya.

Upper *leaves* 5 by  $1\frac{1}{2}$  in.; petiole  $\frac{2}{3}$  in. *Spike* (coming into flower) 10 in.; lower clusters distant, many-fl'd., upper few-fl'd., continuous; bracts  $\frac{1}{8}$  in. *Calyx*  $\frac{1}{4}$  in.; lobes linear-lanceolate. *Corolla* white, pubescent; lobes  $\frac{2}{3}$  by  $\frac{1}{4}$  in. *Capsule* not seen.—Described from *T. Anderson's* Singapore example. The name should be *E. Blumei*, but there is no authentic example of that for comparison; nor is it known whether, by recording *E. Blumei* among the Indian *Acanthaceæ*, *T. Anderson* alluded to his Singapore plant.

8. **E. cinnabarinum**, *Wall. Pl. As. Rar.* i. 20, t. 21, and *Cat.* 9088; leaves large elliptic acuminate at both ends glabrous, spikes rather short rigidly paniced fuscous-puberulous, corolla crimson tube  $1\frac{1}{2}$  in. linear. *Nees in Wall. Pl. As. Rar.* iii. 108, and in *DC. Prodr.* xi. 453; *T. Anders. in Journ. Linn. Soc.* ix. 524. *E. palatiferum*, *Bot. Mag.* t. 5957, right-hand fig.

LOWER BURMA and TENASSERIM; *Wallich, Parish, Beddome*.

*Leaves*  $8\frac{1}{2}$  by  $2\frac{1}{2}$  in., undulate-crenulate; raphides sunk, obscure; nerves 8–11 pair; petiole  $\frac{1}{2}$ – $1\frac{1}{2}$  in. *Panicles* compound, stout; branches short, patent or ultimately recurved; flowers subsessile, often fascicled; bracts  $\frac{1}{8}$  in., linear. *Sepals*  $\frac{1}{6}$  in., sublinear. *Corolla-tube* linear to the apex; limb 2-lipped, lobes of the lower lip wider than those of the upper; eye often more intensely crimson, sometimes a yellowish spot on the middle lobe of the lower lip.

VAR. *succisifolia*; flowers white. *E. succisifolium*, *Kurz in Journ. As. Soc.* 1876, pt. ii. 142.—*Nicobars*; *Kurz*.—The dried examples show no good distinction between this and *E. cinnabarinum*; the leaves have rather fewer nerves than in *Wallich's* specimen, but not than in his picture; the flowers are hardly smaller than *Wallich's*; the capsules are  $\frac{3}{4}$  in., altogether as of the genus.

9. **E. Parishii**, *Clarke*; leaves elliptic acuminate at both ends glabrous, spikes puberulous or pubescent subpaniced, flowers often fascicled, corolla purplish-pink tube  $1\frac{1}{2}$  in. distinctly funnel-shaped upwards. *E. crenulatum* var. *grandiflora*, *Hook. f. in Bot. Mag.* t. 5440. *Asystasia Parishii*, *T. Anders. in Journ. Linn. Soc.* ix. 526.

MOULMEIN; *Parish*. TENASSERIM; *Beddome*.

*Leaves*  $4\frac{1}{2}$  by  $1\frac{1}{4}$ – $1\frac{1}{2}$  in., very acute, variegated in all the wild examples, densely punctulate not lineolate above; nerves 6 pair; petiole  $\frac{2}{3}$  in. *Spikes* 2–5 in., suberect; bracts  $\frac{1}{8}$  in. *Sepals*  $\frac{1}{6}$  in., linear-lanceolate, pubescent. *Corolla-tube* linear below, upper  $\frac{1}{3}$  part distinctly widened subinflated; limb  $\frac{3}{4}$  in. diam., segments subequal. *Anthers* subexsert. *Ovary* glabrous or very nearly so.—In *Bot. Mag.* t. 5440, the stamens are figured 4 subequal; in the accompanying text they are said to be 2 or 4. Wild specimens have 2 perfect and 2 minute rudimentary stamens.



10. **E. leptanthus**, *Clarke*; leaves elliptic acuminate at both ends glabrous, racemes elongate many-fld. subglabrous, corolla small tube  $\frac{1}{4}$ – $\frac{1}{3}$  in. linear curved.

MISHMEE HILLS; *Griffith* (Kew Distrib. n. 6181).

Apparently a large herb; branches subterete, glabrous. *Leaves*  $7\frac{1}{2}$  by  $2\frac{1}{4}$  in., not or very obscurely lineolate; nerves 11–16 pair; petiole 1– $1\frac{1}{2}$  in. *Racemes* 5–9 in., 1–5 subterminal, nearly simple; pedicels fascicled, unusually long, upper often  $\frac{1}{6}$  in.; bracts at the base of the pedicels, minute, linear. *Sepals*  $\frac{1}{8}$  in., linear-lanceolate, glabrous, margins puberulous. *Corolla* glabrous; tube linear, slightly inflated, base gibbous; limb subequally 5-lobed. *Stamens* 2, with 2 minute linear rudiments; filaments somewhat ligulate, glabrous; anthers oblong; cells straight, parallel, muticous, on the same level exactly. *Pistil* glabrous; disc annular; ovary 4-ovulate; stigma minute, obscurely bifid. *Capsule* not seen.—A species differing widely from all others, but referred by Mr. Benthams to this genus, of which it appears to possess all the essential characters.

#### SPECIES IMPERFECTLY KNOWN.

11. **E. GRACILIFLORUM**, *Nees in Wall. Pl. As. Rar.* iii. 107, and in *DC. Prodr.* xi. 454; leaves 8 by  $3\frac{1}{2}$  in. elliptic acute at both ends subglabrous, nerves 7–9 pair puberulous beneath, petiole 2– $3\frac{1}{2}$  in. puberulous, thyrses 4 in. dense-fld. and densely pubescent, pedicels 0– $\frac{1}{8}$  in., bracts  $\frac{1}{8}$  in. linear, sepals  $\frac{1}{8}$  in. pubescent, corolla-tube  $1\frac{1}{2}$  in. linear for  $\frac{1}{3}$  its length. *Justicia graciliflora*, *Wall. Cat.* 2427.—Penang Mts.; *Wallich* (specimens without fruit, and with only a very imperfect flower).

12. **E. BIFARIUM**, *Nees in DC. Prodr.* xi. 458; leaves ovate attenuate at both ends glabrate, spike small puberulous, flowers solitary opposite, bracts and bracteoles linear-subulate shorter than the calyx. *Gendarussa bifaria*, *Wall. Cat.* 7173; *Nees in Wall. Pl. As. Rar.* iii. 104.—Pegu; *Pingee*, *Wallich*.—*Leaves* 7 by  $3\frac{1}{4}$  in., entire, minutely lineolate on both surfaces; petiole  $1\frac{1}{2}$  in., puberulous. *Spike* (one only seen)  $2\frac{1}{2}$  in., puberulous; flowers  $\frac{1}{3}$  in. apart. *Calyx-segments*  $\frac{1}{4}$  in., linear, puberulous. *Corolla* not seen. *Capsule*  $\frac{3}{4}$ –1 in., altogether of *Eranthemum*.—*Nees* founded this on the 2 opposite lines of minute crisped hairs near the tips of the branches; which may be seen in *E. album*, *malaccense* and others. The solitary example of *E. bifarium* in *Herb. Wallich* differs from the neighbouring species in its depauperated spike and long-petioled leaves, but it is impossible to say that it may not be one of them.

13. **E. PUBESCENS**, *Roth Nov. Sp.* 1; leaves ovate obtuse, spikes terminal subdistichous, bracts imbricated obovate-oblong mucronate keeled densely pubescent, calyx unequal scarious. *Nees in DC. Prodr.* xi. 458.—India; *Heyne*.—A shrub; branches subtetragonous, ashy farinose. *Leaves* from oblong to ovate, nearly entire, nervose, paler beneath, farinose; petiole 1 in. *Spike* terminal, 3 in., enveloped at base by 4 or 5 ovate acute bracts; proper bracts  $\frac{1}{2}$  in., dense clothed with capitate hairs; bracteoles 2, linear-subulate. *Calyx* 5-leaved, 2 lanceolate subulate, 1 broader 2-nerved sub-bifid, 2 smaller. *Corolla* showy, pubescent without; tube 1 in. filiform, limb of 5 subequal round lobes. *Stamens* 2 with oblong villous anthers, 2 sterile very short. *Style* long, tip semi-bifid. *Capsule* oblong-ovoid, 4-seeded. *Seeds* brown, compressed, ovate subrotund, under a lens elegantly clothed with imbricated adpressed ferruginous scales.

#### XXVII. CODONACANTHUS, *Nees*.

Corolla small ventricose nearly from the base.—Otherwise as *Eranthemum*.

The solitary species differs from *Eranthemum indicum* in its very small flowers; from *E. leptanthus* in its ventricose corolla.

**C. pauciflorus**, *Nees in DC. Prodr.* xi. 103; leaves elliptic acuminate at both ends pubescent on the nerves beneath or glabrate,



flowers  $\frac{1}{2}$  in. many of them distinctly pedicelled. *T. Anders. in Journ. Linn. Soc. ix.* 524. *C. acuminatus*, *Nees l. c.* *Ruellia pauciflora*, *Wall. Cat.* 2369. *Asystasia pauciflora*, *Nees in Wall. Pl. As. Rar. iii.* 90.

KHASIA HILLS, alt. 0–3000 ft., and ASSAM; *Wallich, Jenkins, H. f. & T., &c.* CHITTAGONG HILLS; *Clarke.*—DISTRIB. S. China.

An erect herb. *Leaves* 5 by  $1\frac{1}{4}$ –2 in.; petiole  $\frac{1}{2}$  in., usually pubescent. *Racemes* in the Indian examples forming very compound, slender, terminal, lax panicles; bracts minute linear; pedicels often  $\frac{1}{8}$ – $\frac{1}{6}$  in. *Sepals*  $\frac{1}{8}$  in., linear-lanceolate. *Corolla* glabrous, pink or whiteish; cylindric base of the tube scarcely  $\frac{1}{16}$  in.; lobes 5, ovate, subequal. *Stamens* 2, with 2 minute linear rudiments. *Capsule*  $\frac{1}{2}$  in.; base cylindric, solid. *Seeds* 4 as of *Eranthemum*, but nearly smooth, scarcely rugose.—The Chinese examples all differ from the Indian in their much simpler inflorescence. Bentham, in allowing the genus 2 species in the Gen. Pl., appears to think the Chinese plant distinct, but in the Flora of Hongkong he had united them.

## XXVIII. ANDROGRAPHIS, Wall.

Annual herbs or very small shrubs, erect or procumbent. *Leaves* entire. *Racemes* axillary and terminal, lax, often compound subpanicled, or dense or subcapitate, sometimes reduced and 1-fl'd., frequently 1-sided; bracts small; bracteoles minute or 0. *Sepals* narrow. *Corolla* small, tubular, 2-lipped, white or pink with dark-purple lower lip, pubescent. *Stamens* 2; filaments ciliate or setulose; anthers exserted, 2-celled; cells oblong, parallel, muticous, subequal, base bearded. *Ovary* 6–12-ovulate, thinly hairy; style slender, tip minutely bifid. *Capsule* linear-oblong or elliptic, compressed contrary to the septum, 6–12-seeded. *Seeds* osseous, subquadrate or oblong, not compressed, rugose-pitted, glabrous.—Endemic in India; the 17 species being very closely connected, and identical as to form and colour of flower, and as to seeds.

\* *Capsule linear, thrice as long as broad.*

† *Racemes elongate often loosely subpaniculate, lower flowers distant.*

1. **A. paniculata**, *Nees in Wall. Pl. As. Rar. iii.* 116, and in *DC. Prodr. xi.* 515; leaves lanceolate glabrous, racemes lax paniculate divaricate, pedicels manifest, capsule nearly glabrous. *Wight Ic. t.* 518; *Dalz. & Gibs. Bomb. Fl.* 198; *T. Anders. in Journ. Linn. Soc. ix.* 502; *Bentl. & Trim. Med. Pl. t.* 197. *Justicia paniculata*, *Burm. Fl. Ind.* 9; *Wall. Cat.* 2454; *Blume Bijd.* 788; *Roxb. Fl. Ind. i.* 117.—*Rheede Hort. Mal. t.* 56.

Throughout INDIA from Lucknow and Assam to Ceylon (probably introduced in some of the northern stations).—DISTRIB. Cultivated in the E. and W. Indies.

An erect annual, 1–3 ft.; stems quadrangular, base not pubescent. *Leaves*  $2\frac{1}{2}$  by  $\frac{1}{2}$ – $\frac{3}{4}$  in., narrowed at both ends, never spathulate, ovate at base, paler beneath; petiole  $0\frac{1}{4}$  in. *Racemes* 1–4 in.; pedicels  $0\frac{1}{6}$  in., distant, usually pubescent; bract  $\frac{1}{8}$  in., linear; bracteoles smaller or 0; inflorescence mostly sympodal, the pedicel in the axil of one of each pair of bracts suppressed. *Sepals*  $\frac{1}{8}$  in., linear-lanceolate, pubescent. *Corolla*  $\frac{1}{2}$  in., 2-lipped for at least half its length, hairy; white, spotted rose-purple. *Filaments* hairy upwards. *Ovary* and base of style subglabrous or very thinly hairy. *Capsule*  $\frac{3}{4}$  by  $\frac{1}{8}$  in., young slightly glandular-hairy, mature glabrous. *Seeds* subquadrate, osseous, rugose, without hairs or scales at any period, wet or dry, yellow or deep brown.—Bentley and Trimen's figure is erroneous as to the seeds being hairy. Nees and others have doubted this being Roxburgh's *Justicia paniculata*, because Roxburgh says the bracts are large; but Roxburgh regards the reduced leaves at the base of the racemes as bracts, and does not notice the true small bracts at the base of the pedicels.



2. **A. subspathulata**, *Clarke*; leaves subspathulate elliptic minutely scabrid-punctate on both surfaces, racemes lax divaricate, pedicels manifest, capsule nearly glabrous.

MADRAS; Kurnool at the foot of the Nellymallays, *Beddome*.

In habit resembling *A. paniculata*; stem minutely hispid near the base. *Leaves* 3 by 1 in., apex scarcely acute, base suddenly narrowed; petiole  $\frac{1}{2}$  in., often winged to the base. Lower *pedicels*  $\frac{1}{3}$  in. *Corolla*  $\frac{2}{3}$  in., similar to that of *A. paniculata*, but rather longer.—This has been considered a var. of *A. paniculata*; but points above noted as differential are constant.

3. **A. elongata**, *T. Anders. in Journ. Linn. Soc.* ix. 502; leaves petioled ovate-lanceolate pubescent or glabrate, spikes forming straggling panicles, sepals glabrate or minutely pubescent, anthers exsert not barbate, capsule nearly glabrous. *Justicia elongata*, *Vahl Enum.* i. 130. *J. cordifolia*, *Wall. Cat.* 2482. *Cryptophragmium cordifolium*, *Nees in Wall. Pl. As. Rar.* iii. 100. *C. elongatum*, *Nees in DC. Prodr.* xi. 95.

S. DECCAN PENINSULA; Courtallum, *Wight*; Tinnevely Hills, *Beddome*.

Annual, erect, 2–3 ft.; branches divaricate, acutely quadrangular. *Leaves* 2 by 1 in., base somewhat suddenly narrowed or rarely subcordate; raphides inconspicuous; petiole often attaining  $\frac{1}{4}$  in. *Panicles* often a foot each way; pedicels mostly very short. *Sepals*  $\frac{1}{3}$  in., linear-lanceolate. *Corolla*  $\frac{1}{2}$  in., tube curved, limb  $\frac{1}{8}$ – $\frac{1}{6}$  in., obscurely 2-lipped. *Filaments* flattened, glabrous or very nearly so, a little longer than the corolla; anthers glabrous. *Capsule*  $\frac{3}{4}$  by  $\frac{1}{8}$  in., compressed, at first minutely hairy, soon glabrous. *Seeds* osseous, rugose, not compressed, glabrous.

4. **A. ovata**, *Benth. in Gen. Pl.* ii. 1100; stem glandular-hirsute, leaves petioled ovate, spikes often paniced rather lax somewhat recurved, corolla  $\frac{1}{3}$  in., anthers included not barbate, capsule hairy. *Gymnostachyum ovatum*, *T. Anders. ms.*; *Bedd. Ic. Pl. Ind. Or.* t. 250.

DECCAN PENINSULA; Myhendra Hills, Berhampore and Jeypur Hills (Vizagapatam), alt. 2–4000 ft., *Beddome*.

*Stems* 6–10 in., quadrangular, glandular-pubescent or subhirsute below. *Leaves*  $2\frac{1}{2}$ –3 by nearly 2 in., shortly attenuated into the petiole, sparsely hairy above, pubescent on the nerves beneath. *Racemes* axillary and terminal, 2–4 in. *Corolla* as of *A. elongata*. *Filaments* much dilated, thinly minutely hairy. *Capsule*  $\frac{3}{4}$  by  $\frac{1}{8}$  in., compressed. *Seeds* 8–10, subquadrate, osseous, rugose, glabrous, not compressed.—Perhaps a form only of *A. elongata*, *Nees*.

5. **A. tenuiflora**, *T. Anders. in Journ. Linn. Soc.* ix. 502; leaves ovate or lanceolate glabrous or pubescent on the nerves, spikes lax simple or compound, corolla  $\frac{1}{3}$  in. obscurely 2-lipped, anthers included pubescent or slightly bearded, capsule pubescent ultimately glabrate. *Haplanthus tener*, *Nees in Wall. Pl. As. Rar.* iii. 115, and *Cat.* 7185, and in *DC. Prodr.* xi. 512. *Gymnostachyum Parishii* & *andrographioides*, *T. Anders. l. c.* 504.

EASTERN FRONTIER, alt. 500–3000 ft., from Assam to Tavoy, frequent. ANDAMANS; *Kurz.*—DISTRIB. Java, Borneo.

*Stems* 1–2 ft., quadrangular, pubescent, or glabrous unless at the very base. *Leaves* suddenly or cuneately narrowed at base; or the upper sessile, base rounded or subcordate. *Pedicels* rarely  $\frac{1}{10}$  in.—Perhaps not distinct from *A. ovata*: it presents three leading variations, viz. (a) *tenuiflora* type, *T. Anders.*, leaves ovate, spikes long, flowers in remote clusters; (b) *Parishii*, *T. Anders.*, leaves ovate, panicles lax glabrate, flowers mostly solitary; (c) *andrographioides*, *T. Anders.*, leaves lanceolate.

VAR. *recedens*; nearly glabrous except the very lax compound closely glandular-pubescent panicle.—Tenasserim; Mooleeyit, alt. 2000 ft., *Beddome*.

6. **A. alata**, *Nees in DC. Prodr.* xi. 516; leaves petioled ovate upper



linear-oblong glabrous, panicle large lax branches 4-winged, sepals pubescent or subhirsute, capsule hairy. *T. Anders. in Thwaites Enum.* 232, and in *Journ. Linn. Soc.* ix. 502. *Justicia alata*, *Vahl Enum.* i. 139.

S. DECCAN PENINSULA, alt. 1-3000 ft.; Coimbatore, *Wight*, &c.; Nilgherries, *Gardner*. CEYLON; *Thwaites*.

*Stems* 2-4 ft., annual, erect, glabrous, 4-angular. *Leaves*  $3\frac{1}{2}$  by  $1\frac{3}{4}$  in., somewhat suddenly attenuate into the petiole, conspicuously lineolate above; upper leaves few, distant, narrow. *Panicle* often 15 in. diam.; branches glabrous; pedicels  $0-\frac{1}{4}$  in., pubescent. *Sepals*  $\frac{1}{6}-\frac{1}{5}$  in., bristle-pointed, pubescent or very hairy. *Corolla*  $\frac{1}{2}-\frac{2}{3}$  in., hairy, white with pink spots; tube curved, limb obscurely 2-lipped. *Anthers* exserted; filaments subglabrous. *Capsule* 1 by  $\frac{1}{8}$  in., compressed. *Seeds* osseous, glabrous, not compressed.—Perhaps only a variety of *A. elongata*. The panicle being large, the examples of the old collectors show only the panicle with the reduced narrow leaves belonging thereto; and the descriptions of *Vahl*, *Nees* and *T. Anderson* do not describe the proper cauline leaves.

7. ***A. stenophylla***, *Clarke*; glabrous, cauline leaves linear, racemes lax, flowers nearly all pedicelled, capsule glabrous.

COIMBATORE; *Wight* (*Herb. Propr.* n. 2245).

*Rootstock* woody; annual stems from its crown numerous, erect and diffuse, quadrangular. *Leaves*  $1-1\frac{1}{2}$  by  $\frac{1}{8}-\frac{1}{6}$  in.; raphides 0 or obscure. *Racemes* 2-5 in., axillary and terminal, not distinctly paniced, the upper leaves being nearly similar to the cauline; pedicels mostly nearly as long as the calyx. *Sepals*  $\frac{1}{6}$  in., linear-lanceolate, glabrous or very nearly so. *Corolla* nearly as of *A. paniculata*. *Capsule*  $\frac{2}{3}$  by  $\frac{1}{6}$  in., compressed.

8. ***A. Wightiana***, *Arn. ex Nees in DC. Prodr.* xi. 517; nearly glabrous, leaves subsessile lanceolate, racemes lax few-fld., pedicels sometimes as long as the calyx, corolla  $\frac{2}{3}$  in. conspicuously 2-lipped, capsule glabrous. *Wight Ic.* t. 1558. *A. gracilis*, *Nees l. c.* 516; *T. Anders. in Journ. Linn. Soc.* ix. 503.—*Rheede Hort. Mal.* ix. t. 44.

S. DECCAN PENINSULA; Courtallum and Anamallay Forests, *Wight*; Mysore, *G. Thomson*; Mangalore, *Hohenacker*; Travancore and Tinnevely Ghauts, *Beddome*.

*Stems* elongate, diffuse, lax, quadrangular, glabrous, or thinly obscurely glandular-hairy. *Leaves* attaining 3 by 1 in., subovate, base obtuse rarely cordate, glabrous minutely lineolate above rarely obscurely scabrid puberulous; petiole  $0-\frac{1}{10}$  in. *Racemes* 2-4 in., weak, glabrous or rarely minutely glandular-hairy; lower pedicels sometimes  $\frac{1}{3}$  in. *Sepals*  $\frac{1}{5}$  in., sublinear, lineolate, glabrous. *Corolla* purplish, spotted on the lower lip; lips  $\frac{1}{3}$  in. *Anthers* exserted, slightly bearded at the base; filaments setulose. *Capsule*  $\frac{3}{4}-1$  by  $\frac{1}{8}-\frac{1}{6}$  in.—Authentic examples only differ from *A. gracilis* in the few thin glandular hairs scattered on the upper part of the stem and panicle. That *Nees* understood the same plant as *Arnott* and *Wight* is clear from his saying that in his *A. Wightiana* the calyx was glabrous.

9. ***A. macrobotrys***, *Nees in DC. Prodr.* xi. 516; sparingly pubescent, leaves very short-petioled oblong-lanceolate, racemes elongate, sepals glandular-hairy, corolla  $\frac{2}{3}$  in. conspicuously 2-lipped, capsule glabrous. *A. Wightiana*, *T. Anders. in Thwaites Enum.* 232, and in *Journ. Linn. Soc.* ix. 502, not of *Nees*.

MTS. of S. DECCAN PENINSULA; Mangalore, *Hohenacker*; Anamallays and Pulneys, *Beddome*. CEYLON; *Macrae*, &c.

*Leaves* 3 by  $\frac{3}{4}$  in.; base cuneate or rhomboid, not rounded; nerves beneath often puberulous; petiole  $0-\frac{1}{3}$  in. *Racemes* 6-8 in. or more, glandular-hairy, often 1-2-branched. *Corolla* and *capsule* exactly as of *A. Wightiana*.—Very near *A. Wightiana*; but dries blacker, and has the leaves not widest at the base.

VAR. *parvifolia*; leaves  $1-1\frac{3}{4}$  in. *A. ceylanica*, *Nees l. c.* 518; *T. Anders. in Journ. Linn. Soc.* ix. 502, not of *Wight*.—Ceylon; *Walker*.



†† *Racemes dense, forming a viscous brown-hairy head or panicle.*

10. **A. viscosula**, *Nees in Wall. Pl. As. Rar.* iii. 116, and in *DC. Prodr.* xi. 517; leaves lanceolate glabrous densely lineolate above, corolla  $\frac{2}{3}$  in. hairy. *Wight Ic.* t. 1559; *T. Anders. in Journ. Linn. Soc.* ix. 502. *Justicia lineata*, *Wall. Cat.* 2486, letter b.

S. DECCAN PENINSULA; Courtallum, *Wight* (Herb. Propr. n. 677); Pulney Hills, *Beddome*.

An undershrub, scarcely 1 foot; branches numerous, glabrous, 4-lineolate. *Leaves*  $1\frac{3}{4}$  by  $\frac{1}{2}$  in., narrowed at both ends; petiole  $0-\frac{1}{5}$  in. *Panicles*  $1-2\frac{1}{2}$  in., terminal, many-fl'd., viscidly brown-hairy; pedicels  $0-\frac{1}{10}$  in.; bracts  $\frac{1}{20}$  in., linear. *Sepals*  $\frac{1}{8}-\frac{1}{6}$  in., linear-lanceolate. *Corolla* conspicuously 2-lipped; lips  $\frac{1}{4}-\frac{1}{3}$  in. *Anthers* exserted, bases thinly bearded, filaments thinly bristly. *Capsule*  $\frac{1}{2}-\frac{2}{3}$  by  $\frac{1}{8}$  in., pubescent. *Seeds* osseous, rugose, glabrous, not compressed.

VAR. *explicata*; leaves 3 by  $\frac{3}{4}-1$  in., panicle elongate 6-8 in. less dense, capsules rather larger. *A. ceylanica*, *Wight Ic.* t. 1560, not of *Nees*.—Courtallum; *Wight* (Herb. Propr. nn. 676, 2242). Concan; *Stocks*. Anamallays and Nilgherries, *Beddome*.—Wight himself, after figuring his *A. ceylanica* from n. 676, has altered the name of a portion of his n. 676 to *A. viscosula*.

11. **A. Neesiana**, *Wight Ic.* t. 1561; leaves elliptic acute at both ends sparsely minutely hairy above glabrate beneath, racemes terminal subcapitate, sepals  $\frac{1}{8}$  in., corolla  $\frac{2}{3}$  in. hairy. *T. Anders. in Journ. Linn. Soc.* ix. 502, excl. syn.

PULNEY MTS.; *Wight* (Herb. Propr. n. 2705). WYNAAD; *Beddome*.

*Branches* elongate, undivided, glabrate, obscurely quadrangular. *Leaves*  $2\frac{3}{4}$  by  $1\frac{1}{4}$  in.; hairs remote many-cellular, raphides 0; petiole  $0-\frac{1}{4}$  in. *Racemes* forming a dense panicle 2-5 in. diam., viscidly brown-hairy. *Capsule* attaining 1 by  $\frac{1}{2}$  in., compressed, minutely hairy.—Differs from *A. viscosula* in the absence of raphides from the leaves above.

VAR. *producta*; leaves elongate, heads produced into oblong sub-lax panicles. *A. ceylanica*, *Wight in Herb. Andrographis* sp. n. 13, *Herb. Ind. Or. H. f. & T.*—Shevagherry Hills; *Wight* (Herb. Propr. n. 2702). Tinnevely; *Beddome*. Malabar; *Gibson* (in *Herb. Dalzell*), &c.—*Leaves*  $4\frac{1}{2}$  by  $\frac{1}{4}$  in., subsessile. *Panicles* 5 in., pyramidal. Texture, indumentum, &c., of the leaves exactly as in *A. Neesiana* type.

VAR. *affinis*, *Nees in Wall. Pl. As. Rar.* iii. 116, and in *DC. Prodr.* xi. 517 (sp.); leaves small elliptic or oblong pubescent, panicles pyramidal or oblong viscidly brown-pubescent, corolla  $\frac{1}{2}$  in. *T. Anders. in DC. Prodr.* ix. 502.—Nilgherry and Kurg Mts., frequent; *Wight*, &c.—*Leaves* 1 by  $\frac{1}{2}$  in., or smaller; minutely bristly above with no raphides, pubescent beneath; nerves less impressed on the upper surface, usually fulvous-pubescent. *Capsule* very hairy.

12. **A. stellulata**, *Clarke*; hairy, leaves short-petioled elliptic narrowed at both ends, heads terminal dense, sepals exceeding  $\frac{1}{4}$  in. linear-setaceous, corolla  $\frac{2}{3}$  in. *A. Neesiana*, *Benth. in Pl. Hohenack.* n. 1435, not of *Wight*.

NILGHERRY MTS., alt. 6000 ft., *Hohenacker*, &c.

*Branches* elongate, obscurely quadrangular, closely villous. *Leaves*  $2\frac{1}{2}$  by 1 in., copiously sprinkled with fulvous multicellular hairs above, closely villous beneath; petiole  $0-\frac{1}{3}$  in. *Heads* 1-2 in. diam., viscidly brown-hairy. *Corolla* pale pink with purple spots on the lower lip. *Filaments* somewhat flattened, hairy upwards. *Capsule*  $\frac{3}{4}$  by  $\frac{1}{8}$  in. (and upwards), hairy, compressed. *Seeds* osseous, rugose, glabrous, not compressed.—Much resembling *A. Neesiana* and others of this subsection, but distinguished by the long substellate sepals.

13. **A. lineata**, *Nees in Wall. Pl. As. Rar.* iii. 116, and in *DC.*



*Prodr.* xi. 516; leaves subsessile ovate or broadly oblong shortly acute glabrous, panicles very compound viscidly grey- or dusky-pubescent, corolla  $\frac{2}{3}$  in. *T. Anders. in Journ. Linn. Soc.* ix. 502.—*Andrographis* sp. n. 14, *Herb. Ind. Or. H. f. & T.* *Justicia lineata*, *Wall. Cat.* 2486, letter a.

S. DECCAN PENINSULA; Mysore and adjacent parts of the Nilghiri and Kurg Mts., *Wight*, *G. Thomson*, *Lobb*; Anamallays, *Beddome*.

*Branches* elongate, quadrangular, glabrous. *Leaves*  $1\frac{3}{4}$  by 1 in., suddenly acute, base rounded; raphides above embedded, obscure; nerves beneath usually strongly elevated; petiole  $0-\frac{1}{2}$  in. *Panicle* 2–10 in.; pedicels 0 or very short. *Sepals*  $\frac{1}{8}-\frac{1}{6}$  in., linear-lanceolate acute, glandular-hairy. *Corolla* hairy. *Anthers* bearded at the base. *Capsule*  $\frac{3}{4}$  by  $\frac{1}{8}-\frac{1}{6}$  in., thinly hairy.—Hardly separable from *A. viscosula* var. *explicata* by the less acuminate leaves with more strongly-marked nerves and the more densely bearded anthers.

VAR. *Lawii*; stem closely pubescent, leaves 3 in. sparsely pilose above pubescent beneath, panicle large open.—Bababoodun Hills; *Law*. Nundidroog, *Beddome*.—Referred to *A. affinis* in *Herb. Hooker*: the large strongly lineate leaves, large panicle and densely barbate anthers bring it nearer to *A. lineata* type.

14. **A. lobelioides**, *Wight Ill.* t. 164 b, fig. 11, and *Ic.* t. 1557; leaves small sessile ovate pubescent or glabrous, racemes in a subterminal panicle, corolla  $\frac{1}{3}$  in. *T. Anders. in Journ. Linn. Soc.* ix. 503. *Justicia lobelioides*, *Wall. Cat.* 2484. *Erianthera lobelioides*, *Nees in Wall. Pl. As. Rar.* iii. 115, and in *DC. Prodr.* xi. 514.

NILGHIRI MTS., alt. 6–8000 ft., common in the open grass, *Wight*, &c.

Very rusty pubescent or nearly glabrous. *Rootstock* woody; stems 2–8 in., very numerous, procumbent. *Leaves*  $\frac{1}{4}-\frac{3}{4}$  in. diam. *Panicles* 1–4 in.; lower pedicels  $\frac{1}{10}-\frac{1}{4}$  in. *Sepals*  $\frac{1}{3}$  in. *Anthers* much exserted, conspicuously white-barbate. *Capsule*  $\frac{2}{3}$  by  $\frac{1}{8}$  in.—Very variable in indumentum. Easily distinguished (without the fruit) from *A. serpyllifolia* by the absence of flowers in the lower axils.

VAR. *composita*; racemes elongate compound forming a terminal quasi-panicle 12 by 8 in.—Courtallum Hills and Tinnevely; *Beddome*.

\*\* *Capsule elliptic*, 2–3 times as long as broad.

15. **A. echioides**, *Nees in Wall. Pl. As. Rar.* iii. 117, and in *DC. Prodr.* xi. 518; erect, hairy, leaves sessile oblong or subelliptic obtuse, racemes numerous axillary, corolla  $\frac{1}{3}-\frac{1}{2}$  in. *Wight Ic.* t. 467; *Dalz. & Gibs. Bomb. Fl.* 198; *T. Anders. in Journ. Linn. Soc.* ix. 503. *Justicia echioides*, *Linn.*; *Burm. Fl. Ind.* 9; *Roxb. Fl. Ind.* i. 118; *Wall. Cat.* 2439.—*Rheede Hort. Mal.* ix. t. 46.

TROPICAL INDIA, in the drier districts from the Punjab and Chota Nagpore to Ceylon, common (absent in Bengal proper and humid Malabar).

Annual, 8–24 in., closely pubescent and with patent white hairs. *Leaves*  $2\frac{1}{2}$  by 1 in., base cuneate. *Racemes* about as long as the leaves, divaricate or recurved, often one from each axil about the middle of the stem; pedicels very short. *Sepals*  $\frac{1}{6}-\frac{1}{4}$  in., linear; in fruit elongated, sometimes  $\frac{1}{2}$  in. *Corolla* pubescent, pink or white, lower lip dark-purple. *Anthers* much exserted, white-barbate. *Capsule*  $\frac{1}{3}$  by  $\frac{1}{6}$  in., acute at both ends, hairy. *Seeds* twice as long as broad, osseous, rugose, glabrous, not compressed.

16. **A. glandulosa**, *Nees in Wall. Pl. As. Rar.* iii. 115, and in *DC. Prodr.* xi. 518; hairy, leaves petioled oblong or subelliptic obtuse, racemes numerous axillary, lower pedicels nearly as long as the calyx. *Justicia glandulosa*, *Wall. Cat.* 2485.

MYSORE; *Heyne* (fide *Nees*), *Wight* (*Herb. Prop.* n. 2026).

*Leaves* 1 by  $\frac{1}{3}$  in., both in *Wight's* and *Wallich's* examples, on which *Nees*



founds his species; which both hardly differ from *A. echioides* but by their short-petioled (not sessile) leaves and rather shorter ( $\frac{1}{6}$  in.) sepals.—This is certainly *A. glandulosa*, Nees, for he has written his name on Wight's n. 2026, though this appears to be an erect annual.

17. **A. Rothii**, *Clarke*; shrubby, hairy, leaves small shortly petioled ovate or orbicular, racemes axillary lax few-fl'd., lower pedicels nearly as long as the calyx. *Justicia glandulosa*, *Roth Nov. Sp.* 13?; *not of Wall.*

S. DECCAN PENINSULA; *Wight* (Herb. Propr. n. 675).

*Rootstock* woody; branches 8–12 in., wavy, closely pubescent, and with white patent hairs, some glandular. *Leaves*  $\frac{1}{3}$ – $\frac{2}{3}$  in., base rounded or in a few of the lower very shortly attenuated; petiole 0– $\frac{1}{8}$  in. *Racemes* 2–4 in., patent or recurved, wavy, sometimes bifid, upper subpanicled; bracts  $\frac{1}{8}$  in., ovate. *Sepals*  $\frac{1}{6}$ – $\frac{1}{5}$  in. *Capsule*  $\frac{1}{3}$  by  $\frac{1}{8}$  in., subobtuse.—Found loose in Wight's Herbarium, marked simply *Erianthera*: it appears to fit very closely Roth's description of his *Justicia glandulosa*.

18. **A. serpyllifolia**, *Wight Ic. t.* 517; stems procumbent villous, leaves small sessile orbicular, racemes many 1- or few-fl'd. in the lower axils. *T. Anders. in Journ. Linn. Soc.* ix. 503. *Justicia serpyllifolia*, *Vahl Enum.* i. 169. *J. nummularifolia*, *Wall. Cat.* 2461. *Erianthera serpyllifolia*, *Nees in Wall. Pl. As. Rar.* iii. 115, and in *DC. Prodr.* xi. 514.

S. DECCAN PENINSULA; Mysore, Palamcotta, &c., *Shuter, Wight, &c.*

*Rootstock* woody; annual stems 2–12 in., closely procumbent, curved, densely leafy. *Leaves*  $\frac{1}{2}$  in. diam., obtuse, more or less hairy. *Racemes* sometimes forming a small terminal quasi-panicle, but always with many 1–2-fl'd. in the lower axils; bracts  $\frac{1}{10}$ – $\frac{1}{6}$  in., orbicular, being gradually reduced leaves. *Sepals*  $\frac{1}{6}$ – $\frac{1}{4}$  in., linear; in fruit often  $\frac{1}{3}$  in. *Corolla*  $\frac{1}{3}$ – $\frac{1}{2}$  in. *Capsule*  $\frac{1}{3}$ – $\frac{1}{2}$  by  $\frac{1}{8}$ – $\frac{1}{6}$  in.

19. **A. Beddomei**, *Clarke*; leaves short-petioled elliptic and obovate glabrous, racemes solitary axillary small few-fl'd., lower pedicels viscoso-pubescent, corolla  $\frac{1}{2}$ – $\frac{2}{3}$  in. conspicuously 2-lipped, anthers exerted bases densely white-bearded.

MADRAS; Kurnool, Nallaymallays, alt. 2000 ft., *Beddome*.

*Stems* 4–6 in., subsimple, quadrangular. *Leaves*  $3\frac{1}{2}$  by  $1\frac{1}{2}$ –2 in., subobtuse, somewhat coriaceous, base cuneate, raphides 0 or obscure; petiole 0– $\frac{1}{6}$  in. *Racemes*  $\frac{3}{4}$  in., 3–5-fl'd., viscoso-pubescent; bracts  $\frac{1}{8}$  in., oblong, subobtuse. *Calyx*  $\frac{1}{4}$  in. *Corolla* and *stamens* nearly as of *A. echioides*. *Capsule* not seen.

## XXIX. HAPLANTHUS, Nees.

Erect herbs. *Leaves* petioled, ovate, entire. *Flowers* axillary, appearing whorled, whorls sometimes approximated into terminal spikes, surrounded by numerous barren branchlets, reduced to acicular cladodes terminated by 2–3 minute spines; proper bracts and bracteoles small. *Calyx* small; sepals sublinear. *Corolla* smallish, tubular; limb 2-lipped; lobes imbricated. *Stamens* 2; anthers 2-celled; cells ovate, equal or one sometimes much smaller, muticous; connective very hairy behind. *Ovary* 6–16-ovulate; style shortly bifid at the tip. *Capsule* narrowly oblong acute, 6–16-seeded from the base. *Seeds* ellipsoid, somewhat compressed, densely shortly hairy when moistened.—Species 3, endemic in India.

1. **H. verticillaris**, *Nees in DC. Prodr.* ix. 513; cladodes in fruit stout rigid pubescent scarcely ciliate towards the tips, calyx minutely pubescent or glabrate. *Dalz. & Gibs. Bomb. Fl.* 197; *T. Anders. in Journ. Linn. Soc.* ix. 504. *Justicia verticillata*, *Rorb. Fl. Ind.* i. 135.



W. DECCAN PENINSULA, frequent, *Roxburgh*, &c., extending north to Mt. Aboo, *Stocks*.

*Stems* 2–3 ft., pubescent or nearly glabrous. *Leaves*  $3\frac{1}{2}$  by 2 in., shortly acuminate, base suddenly attenuated, pubescent or nearly glabrous; petiole 1 in. *Cladodes* often 1–1½ in. in fruit, pubescent or glabrous, with or without scattered patent bristles in their lower half. *Calyx*  $\frac{1}{8}$  in., glabrous or puberulous. *Corolla*  $\frac{2}{3}$  in., pale lilac. *Calyx*  $\frac{1}{2}$  in. and upwards, glabrous.

2. **H. tentaculatus**, *Nees in DC. Prodr.* xi. 513; cladodes in fruit slender curved glabrous or pubescent not ciliate, calyx pubescent scarcely ciliate. *Dalz. & Gibs. Bomb. Fl.* 197; *T. Anders. in Journ. Linn. Soc.* ix. 503. *Ruellia tentaculata*, *Linn. Amœn. Acad.* iv. 320; *Burm. Fl. Ind.* 134, t. 40, fig. 1. *R. aciculata*, *Roth Nov. Sp.* 301.

BOMBAY; *Dalzell*. BELGAUM; *Ritchie*. MALABAR; Yelwah Hill in Palghaut, *Beddome*. CENTRAL INDIA; Mandoo, *Edgeworth*.

*Cladodes* in fruit  $\frac{1}{2}$  in. *Corolla* less than  $\frac{1}{2}$  in., white (*Ritchie*). *Capsule*  $\frac{1}{4}$ – $\frac{1}{2}$  in., glabrous; seeds much smaller than in *H. verticillaris*.—Very near *H. verticillaris*. *Dalzell* says l. c. that *H. tentaculatus* is a much stouter species than *H. verticillaris*; but his numerous examples submitted are named by him in accordance with *Nees'* naming.

VAR. *nilgherrensis*; whorls collected mostly in terminal spikes, cladodes and sepals with many patent needle-like white hairs. *H. nilgherrensis*, *Wight Ic.* t. 1556.—Mts. of Nilghiri and Kurg, frequent; *Wight, Hohenacker*, &c.

VAR. *plumosa*; calyx densely hispid-hairy subplumose. *H. plumosa*, *T. Anders. in Journ. Linn. Soc.* ix. 504. *Haplanthus* sp. n. 4, *Herb. Ind. Or. H. f. & T.*—Concan; *Stocks*. Belgaum; *Ritchie*.

3. **H. ? hygrophiloides**, *T. Anders. in Journ. Linn. Soc.* ix. 503; leaves petioled ovate acute tomentose on both surfaces, flowers axillary aggregated, bracts minute linear.

PEGU; *Brandis* (fide *T. Anderson*).

An insignificant weed; stems 4-angular furfuraceous. *Leaves* 1–1½ by  $\frac{1}{2}$ –1 in., minutely lineolate. *Sepals*  $\frac{1}{4}$  in., subulate. *Corolla* small, pubescent. *Stamens* 2; anthers 2-celled, one cell bearded. *Capsule* linear, compressed, glandular, many-seeded.—No example seen; the foregoing copied from *T. Anderson*.

### XXX. GYMNSTACHYUM, *Nees*.

Herbs or undershrubs. *Leaves* cauline or subradical, entire, sinuate crenulate or toothed. *Cymes* axillary or in a terminal panicle, often spicate or racemose, sometimes small axillary; bracts and bracteoles very small, except in *G. hirsutum*; flowers subsessile or shortly pedicelled. *Calyx* small (except in *G. hirsutum*), sub-5-partite; segments equal, linear-lanceolate. *Corolla-tube* slender, cylindric; limb small, 2-lipped; lobes 5, subequal, quadrate-elliptic, imbricate. *Stamens* 2, nearly as long as the corolla; filaments usually hairy at least near the base; anthers 2-celled; cells subequal, oblong or ovate, hairy or glabrous. *Ovary* pubescent, many-ovulate; style subentire at the tip. *Capsule* linear, pubescent or nearly glabrate, 16–24-seeded. *Seeds* ovoid, compressed, hairy, hairs very shortly spreading when moistened.—Species 15, Indian, with a few Malayan.

\* Panicle terminal, leafless or nearly so.

† *Leaves* mostly near the base of the stem.

1. **G. venustum**, *T. Anders. in Journ. Linn. Soc.* ix. 506; leaves large



ovate, panicle large pubescent, corolla  $\frac{3}{4}$ –1 in. slender. *Justicia venusta*, Wall. Cat. 2470, and *Pl. As. Rar.* i. 53, t. 66; *Bot. Reg.* t. 1380. *Cryptophragmium venustum*, Nees in Wall. *Pl. As. Rar.* iii. 180, and in *DC. Prodr.* xi. 94; *Bot. Mag.* t. 3208.

KHASIA MTS., alt. 0–4000 ft., common on the southern face, Wallich., H. f. & T., &c.

Attaining 1–4 ft.; stem leafless or with few remote very small leaves. Radical leaves 6 by 3–4 in., or larger, acute, decurrent on the petiole, entire or undulate-crenate, nearly glabrous, or with scattered minute hairs above, nerves beneath pubescent; petiole 0–4 in. Panicle sometimes 8 by 12 in., or reduced to a single spike; flowers opposite, 1–3 together; bracts small, linear; bracteoles 0. Sepals  $\frac{1}{8}$ – $\frac{1}{6}$  in., linear, hairy. Corolla pubescent; limb deep purple or blueish. Anthers oblong, glabrous. Capsule  $\frac{3}{4}$  in.

2. **G. febrifugum**, Benth. in *Flora* 1849, 558; leaves ovate, panicle puberulous, corolla  $1\frac{1}{4}$  in. upper half inflated, capsule 1 in. *G. alatum*, Wight Ic. t. 1525; T. Anders. in *Journ. Linn. Soc.* ix. 506.

S. DECCAN PENINSULA; Mangalore, Hohenacker (n. 374), Wight.

Nearly stemless. Leaves  $6\frac{1}{2}$  by 3 in., decurrent on the petiole, subentire or undulate-crenulate, above lineolate nearly glabrous or minutely sparsely setulose, beneath paler glabrous or pubescent on the nerves. Panicles 6–12 in., in appearance radical; flowers opposite, solitary or in very small few-fl. cymes; bracts small, narrow; bracteoles 0. Sepals  $\frac{1}{8}$ – $\frac{1}{6}$  in., glabrous or puberulous. Corolla glabrous. Anthers ovate, hairy.—Hohenacker observes that “a decoction of the root is a febrifuge,” and Bentham’s name *febrifugum* has one year’s priority over *alatum*.

3. **G. ceylanicum**, Arn. & Nees in *DC. Prodr.* xi. 93; leaves elliptic glabrate lineolate above, panicles linear pubescent, corolla  $\frac{3}{4}$  in. T. Anders. in *Thwaites Enum.* 232, and in *Journ. Linn. Soc.* ix. 506; *Bedd. Ic. Pl. Ind. Or.* t. 265.

CEYLON; Walker, Thwaites, &c.

Stem 1–3 in., villous. Leaves 3 by  $1\frac{1}{4}$  in., obtuse, base acuminate, undulate-crenate, pubescent beneath especially on the nerves; petiole  $1\frac{1}{2}$  in. Peduncles 1–6 in.; panicles 5–9 by  $\frac{3}{4}$  in.; cymes small, subfascicled; bracts  $\frac{1}{8}$  in., linear. Sepals  $\frac{1}{6}$  in., linear-lanceolate, grey-pubescent. Corolla nearly glabrous; tube narrow purplish; limb small greenish-yellow. Anthers subquadrate, glabrous. Capsule  $\frac{3}{4}$  in.

4. **G. Thwaitesii**, T. Anders. in *Thwaites Enum.* 232; leaves elliptic hairy on both surfaces, panicles oblong pubescent, corolla  $\frac{1}{2}$  in. *Bedd. Ic. Pl. Ind. Or.* t. 255.

CEYLON; Ambagamowa District, Thwaites.

Leaves above with many lax multicellular hairs. Panicle open; lateral cymes  $\frac{1}{2}$ – $1\frac{1}{2}$  in. Otherwise as *G. ceylanicum*.

5. **G. polyanthum**, Wight Ic. t. 1494; leaves broadly ovate subglabrate base rounded or cordate, panicles linear glabrous or nearly so, corolla  $\frac{2}{3}$  in.

COORG; Jerdon, in *Herb. Wight*.

Stem 1 in., grey-puberulous. Leaves  $2\frac{1}{2}$  in. diam., shortly acute or subobtuse, nearly entire, punctulate above; nerves beneath much raised, grey-puberulous; petiole  $1\frac{3}{4}$  in. Panicles 8 by  $\frac{3}{4}$  in.; flowers in subcapitate cymes; bracts minute, linear. Sepals  $\frac{1}{8}$ – $\frac{1}{6}$  in., linear-lanceolate, glabrous or obscurely puberulous. Corolla puberulous, pink (in the dried example). Capsule  $\frac{2}{3}$  in.—Overlooked by T. Anderson.

†† Stems elongate, leafy upwards.

6. **G. paniculatum**, T. Anders. in *Thwaites Enum.* 232; leaves ovate



or elliptic acute at both ends pubescent at least on the nerves beneath, panicle subterminal pubescent branches cymose, corolla  $\frac{2}{3}$  in. *Bedd. Ic. Pl. Ind. Or.* t. 252.

CEYLON, alt. 1–2000 ft.; *Walker, Thwaites*.

Erect, 2–3 ft., hairy, leafy to the panicle. *Leaves* 5 by 2 in., undulate, lineolate, glabrate or hairy above; petiole  $\frac{1}{2}$  in. *Panicles* 7 by 3 in., sometimes somewhat leafy at the base; lateral branches repeatedly closely 2–3-chotomous; bracts  $\frac{1}{8}$ – $\frac{1}{6}$  in., linear; pedicels 0– $\frac{1}{8}$  in., often distinct. *Sepals*  $\frac{1}{6}$  in., linear-lanceolate, pubescent. *Corolla* pubescent. *Anthers* ovate, glabrous. *Capsule*  $\frac{2}{3}$  in.

7. **G. glabrum**, *T. Anders. in Journ. Linn. Soc.* ix. 506; leaves ovate or elliptic acuminate at both ends undulate-crenate pubescent on the nerves beneath, panicle terminal villous, flowers fascicled on the spikes, corolla  $\frac{2}{3}$  in. *Bedd. Ic. Pl. Ind. Or.* t. 251. *Cryptophragmium glabrum*, *Dalz. in Hook. Kew Journ.* ii. 338; *Dalz. & Gibs. Bomb. Fl.* 185.

CONCAN; *Law, Dalzell*.

An undershrub (Beddome); stems nearly glabrous. *Leaves* 7 by  $2\frac{3}{4}$  in., puberulous on both surfaces or glabrate; petiole  $\frac{3}{4}$  in. *Flowers* sessile, clustered; bracts  $\frac{1}{8}$  in., linear-lanceolate. *Sepals*  $\frac{1}{6}$  in., sublinear, villous, often viscid glandular. *Corolla* minutely pubescent, white purple-spotted in the throat. *Anthers* ovate, glabrous. *Capsule*  $\frac{3}{4}$  in.

VAR. *denticulata*; leaves distinctly toothed glabrous even when young.—Concan Ghauts; *Dalzell, Ritchie*.

8. **G. leptostachyum**, *Nees in Wall. Pl. As. Rar.* iii. 106, and *Cat.* 7178, and in *DC. Prodr.* xi. 93; leaves elliptic acuminate at both ends slightly pubescent, panicle reduced to 1 or 2 long-linear spikes hairy, corolla  $\frac{2}{3}$  in.

TAVOY; *Wallich*.

*Stems* creeping, rooting; annual flowering branches 3–5 in., erect, simple, villous. *Leaves*  $4\frac{1}{2}$  by  $1\frac{1}{2}$  in., subentire, upper surface with distant multicellular lax hairs, lower pubescent on the nerves; petiole  $\frac{1}{2}$  in. *Spikes* 1 or 2 terminal, 3–10 in.; flowers solitary, distant; bracts  $\frac{1}{8}$  in., linear-lanceolate. *Sepals*  $\frac{1}{8}$  in., linear-lanceolate, pubescent. *Corolla* narrow, straight. *Capsule*  $\frac{1}{2}$  in., very slender, 20-seeded.—Overlooked by T. Anderson.

\*\* Inflorescence axillary, a terminal panicle sometimes added.

9. **G. canescens**, *T. Anders. in Journ. Linn. Soc.* ix. 505; leaves ovate acuminate at both ends pubescent on both surfaces, panicles axillary and terminal pubescent or villous, corolla  $\frac{2}{3}$  in. *G. serrulatum*, *T. Anders. l. c.*; *Bedd. Ic. Pl. Ind. Or.* t. 254. *Cryptophragmium canescens*, *Nees in Wall. Pl. As. Rar.* iii. 100, and in *DC. Prodr.* xi. 95; *Wight Ic.* t. 1495. *C. serrulatum*, *Nees ll. c.* *Justicia serrulata*, *Wall. Cat.* 2452.

W. DECCAN PENINSULA, from Bombay to Courtallum, *Wight*; Tinnevely, *Beddome*.

Apparently a shrub. *Branches* pubescent or villous. *Leaves* 8 by  $3\frac{3}{4}$  in., undulate or minutely toothed; petiole  $1\frac{1}{2}$  in. *Panicles* trichotomous; bracts  $\frac{1}{8}$  in., lanceolate; pedicels hardly any. *Sepals*  $\frac{1}{8}$ – $\frac{1}{4}$  in., linear-lanceolate, minutely pubescent. *Corolla* pubescent. *Anthers* ovate, puberulous. *Capsule*  $\frac{1}{2}$  in.—Nees made 2 species out of Wallich's 4 branches; and it is not clear why T. Anderson kept them up, unless he meant to transfer Nees' name *serrulatum* to the following var.

VAR. *longifolia*; leaves 9 by  $1\frac{3}{4}$  in. elongate lanceolate distinctly toothed. *G. longifolia*, *T. Anders. ms.*—Canara Ghauts; *Law*.

10. **G. latifolium**, *T. Anders. in Journ. Linn. Soc.* ix. 505; glabrous,



leaves large long-petioled ovate, panicles mostly lateral many-fld., corolla 1 in. *Bedd. Ic. Pl. Ind. Or.* t. 253. *Cryptophragmium latifolium*, *Dalz. in Hook. Kew Journ.* ii. 137; *Dalz. & Gibbs. Bomb. Fl.* 185. *Phlogacanthus latifolius*, *Wight Ic.* t. 1537; *T. Anders. in Journ. Linn. Soc.* ix. 508.

CONCAN, CANARA, and MALABAR, *Dalzell, Wight, &c.*; Bababoodun Hills, *Wight*.

An undershrub, 3 ft. (*Dalzell*). *Leaves* attaining 9 by  $5\frac{3}{4}$  in., acute, very shortly acuminate into the petiole, subentire; petiole often 6 in. *Panicles* chiefly from the axils of fallen leaves, 3–5 in.; branches subspicate; flowers solitary or clustered; bracts small, linear. *Sepals*  $\frac{1}{2}$  in., linear. *Corolla* puberulous; limb greenish-yellow. *Anthers* ovate, minutely hairy. *Capsule*  $\frac{3}{4}$  in., very narrow, glabrate, 24-seeded. *Seeds* ovoid, compressed, hairy.

11. **G. sanguinolentum**, *T. Anders. in Thwaites Enum.* 232, and in *Journ. Linn. Soc.* ix. 506; leaves elliptic narrowed at both ends nearly glabrous, cymes small axillary short-peduncled few-fld. subglobose somewhat pubescent, corolla  $\frac{3}{4}$  in. *Justicia sanguinolenta*, *Vahl Symb.* ii. 10. *Cryptophragmium sanguinolentum*, *Nees in DC. Prodr.* xi. 96. *C. axillare*, *Nees l. c.*; *Wight Ic.* t. 1496.

CEYLON; *Champion, Walker, &c.*

Diffuse; branches nearly glabrous. *Leaves* 4 by  $1\frac{1}{2}$  in., entire undulate or irregularly subdentate, punctate or minutely lineolate above sometimes obscurely scaberulous; petiole  $\frac{1}{4}$ – $\frac{1}{2}$  in. *Peduncles*  $\frac{1}{8}$ – $\frac{1}{2}$  in., nearly glabrous; cymes  $\frac{1}{2}$ –1 in. diam.; bracts  $\frac{1}{8}$  in., linear; pedicels 0– $\frac{1}{8}$  in. *Sepals*  $\frac{1}{8}$  in., linear, puberulous. *Corolla* pubescent. *Capsule*  $\frac{3}{4}$  in.

12. **G. tomentosum**, *T. Anders. in Journ. Linn. Soc.* ix. 505; glandular-tomentose, leaves ovate hirsute on both surfaces, spikes axillary and terminal trichotomous, corolla  $\frac{4}{5}$  in. subcylindric pubescent.

CENTRAL INDIA; *Beddome* (fide *T. Anderson*).

A perennial, erect herb, 1–2 ft. Upper *leaves* 1 by  $\frac{3}{8}$  in., sessile, base attenuated, undulate, whitened beneath. *Spikes* dense; flowers pedicelled; bracts  $\frac{1}{2}$  in., linear, glandular ciliate. *Sepals*  $\frac{1}{2}$  in., aristate ciliate. *Stamens* included; anther-cells equal. *Capsule* 1 in., linear, many-seeded; retinacula erect, acute (*T. Anderson*).—Not seen, genus very doubtful.

13. **G. hirsutum**, *T. Anders. in Thwaites Enum.* 233, and in *Journ. Linn. Soc.* ix. 505; leaves broadly elliptic acute or ovate acute at both ends hairy on both surfaces, spikes axillary and terminal dense cylindric hirsute, bracteoles  $\frac{1}{2}$  in. linear, corolla  $\frac{3}{4}$  in. *Bedd. Ic. Pl. Ind. Or.* t. 249.

CEYLON; *Thwaites*.

Erect, 2–3 ft., glabrous except at the tip. *Leaves* 8 by  $3\frac{1}{2}$  in., entire or undulate; petiole 2 in. *Spikes* 1–4 by 1 in., quasi-peduncled, sometimes paniced, resembling those of the dense-fld. species of *Ebermaiera*. *Sepals*  $\frac{1}{2}$  in., linear, hirsute. *Corolla*, *stamens* and *pistil* as of *Gymnostachyum* (fide *Beddome*). *Capsule*  $\frac{3}{4}$  in., many-seeded.

### XXXI. PHLOGACANTHUS, *Nees*.

Shrubs or tall herbs. *Leaves* entire, or obscurely crenate. *Flowers* orange red or pink; thyrses or narrow panicles terminal, rarely racemes or cymes axillary; bracts small, bracteoles 0. *Calyx* deeply 5-fid; segments very narrow. *Corolla* tubular, curved upwards; limb on one side or (not very deeply) 2-lipped; segments ovate or oblong, connivent patent or recurved, imbricate in bud. *Stamens* 2, sometimes 2 small rudiments added;



anthers 2-celled, oblong, muticous, glabrous. *Ovary* usually glabrous, 10–16-ovulate; style filiform, subsimple at the tip. *Capsule* elongate, sub-tetragonous, many-seeded from the base. *Seeds* lenticular, ovate in outline, glabrous or densely shortly hairy.—Species 11, endemic in India.

This genus differs from *Gymnostachyum* in the broader, curved corolla, the glabrous ovary, and the much stouter capsule. The 2 following genera *Cystacanthus* and *Diotacanthus* are with difficulty discerned by the form of the corolla.

\* *Thyrse* or *dense panicles* terminal.

1. ***P. curviflorus***, *Nees in Wall. Pl. As. Rar.* iii. 99, and in *DC. Prodr.* xi. 320; leaves large elliptic or obovate nearly glabrous, thyrse dense closely villous, calyx-teeth  $\frac{1}{2}$  in., corolla  $1\frac{3}{4}$  in. tubular curved scarcely widened upwards. *Bot. Mag.* t. 3783; *T. Anders. in Journ. Linn. Soc.* ix. 506; *Kurz For. Fl.* ii. 246. *Justicia curviflora*, *Wall. Cat.* 2429, and *Pl. As. Rar.* ii. 9, t. 112.

KHASIA MTS., alt. 0–4000 ft.; frequent on the southern face, *Wallich*, &c.

*Stem* 3–6 ft., stout, glabrous, puberulous upwards. Uppermost leaves often 12 by 4–5 in., acuminate at both ends, subentire, punctulate on both surfaces, nerves beneath sometimes puberulous; petiole  $2\frac{1}{2}$  in. *Thyrse* 4–8 in., short-peduncled; bracts  $\frac{1}{2}$  in., linear. *Calyx-tube*  $\frac{1}{2}$  in.; teeth sublinear, closely villous. *Corolla* densely villous, brick-red or orange; limb small, lobes hardly patent. *Stamens* glabrous, 2 small rudiments present. *Style* thinly hairy. *Capsule*  $1\frac{1}{2}$  by  $\frac{1}{4}$  in., glabrous, 12–14-seeded. *Seeds*  $\frac{1}{8}$  in. diam., much compressed, glabrous.—*Wallich* says the flowers are bright orange-red; it is generally a brick-red obscurely orange; it is not known wild of the colour depicted by *Wallich*, or in *Bot. Mag.*

VAR. *brevicalyx*; calyx-teeth scarcely  $\frac{1}{2}$  in.—*Pegu*; *Kurz.* Moulmein; *Parish.* Tenasserim; *Beddome*.—A shrub, 15 ft. (*Beddome*). *Thyrse* much less densely villous than in *P. curviflorus* type. *Sepals* without sometimes nearly glabrous, much shorter than in *P. curviflorus* type. *Flowers* greenish-yellow (*Parish*).—*T. Anderson* is mistaken in supposing that this variety is cultivated in Lower Burma, and not wild.

2. ***P. Wallichii***, *Clarke*; leaves large elliptic acuminate at both ends glabrous, thyrse dense closely villous, calyx-teeth  $\frac{1}{2}$  in., corolla  $\frac{3}{4}$  in. tubular curved scarcely widened upwards. *P. asperulus*, *Wall. Cat.* 7171 partly, not of *Nees*. *Loxanthus Gomezii*, *Nees in Wall. Cat.* 7170, and in *Wall. Pl. As. Rar.* iii. 99, and in *DC. Prodr.* xi. 322, partly.

KHASIA MTS.; *Gomez.* JAINTEA HILLS; Jarain, alt. 3000 ft., *Clarke*.

*Leaves*  $10\frac{1}{2}$  by  $3\frac{1}{4}$  in., subentire; petiole 1 in. *Thyrse* 2–4 in., short-peduncled; bracts  $\frac{1}{2}$  in., linear. *Calyx-tube*  $\frac{1}{8}$  in., teeth linear-lanceolate villous. *Corolla* densely villous, red; limb small, lobes subequal, scarcely patent. *Stamens* and *style* glabrous.—Resembling *P. curviflorus*, but with a smaller thyrse, and very much smaller corolla.

3. ***P. tubiflorus***, *Nees in Wall. Pl. As. Rar.* iii. 99, and in *DC. Prodr.* xi. 321; leaves large elliptic or ovate narrowed at both ends softly pubescent beneath, panicles elongate dense somewhat pubescent, calyx-teeth  $\frac{1}{2}$  in., corolla  $\frac{3}{4}$  in. tubular curved scarcely widened upwards. *T. Anders. in Journ. Linn. Soc.* ix. 506, partly. *Justicia tubiflora*, *Wall. Cat.* 2428.

ASSAM PLAINS; *Hamilton, Jenkins, Masters*: and adjacent KHASIA TERAI, alt. 2000 ft.; *Borpani, H. f. & T.*

*Leaves* attaining 10 by 3–5½ in., subentire or crenulate, densely punctulate above, almost woolly (but deciduously) pubescent beneath; petiole 1–2 in., pubescent. *Panicle* 2–8 in., densely closely ramous, subthyrsoid; pedicels often  $\frac{1}{4}$  in.; bracts  $\frac{1}{2}$  in., linear. *Calyx-tube*  $\frac{1}{8}$  in.; teeth linear-lanceolate, pubescent or glabrate. *Corolla* nearly as of *P. Wallichii*, yellow-red (*Nees*). *Capsule*  $1\frac{1}{2}$  by  $\frac{1}{2}$  in., glabrous,



12-seeded. *Seeds* much compressed, glabrous.—Nearly allied to *P. Wallichii*, differing in the softly hairy under surface of the leaves and the much more open panicle.

4. ***P. parviflorus***, *T. Anders. in Journ. Linn. Soc.* ix. 506; leaves large broadly lanceolate glabrous, panicle terminal linear nearly glabrous, sepals  $\frac{1}{8}$  in., corolla 1 in. narrowly tubular curved.

S.E. ASSAM; Namyoon in the Patkoye Mts., *Griffith* (Kew Distrib. n. 6154, n. 6155 partly).

A shrub similar in habit to *P. Wallichii*. *Leaves* 9 by  $2\frac{1}{2}$  in., acuminate at both ends, subentire, obscurely puberulous above, paler and glabrous beneath; petiole 1 in. *Panicles* 4 by  $\frac{3}{4}$  in., subsessile; pedicels  $0-\frac{1}{6}$  in. *Calyx-tube* scarcely  $\frac{1}{10}$  in.; teeth linear-lanceolate, nearly glabrous. *Corolla* very slightly pubescent, blood-red, miniate (*Griffith*); lobes small, scarcely patent. *Capsule* not seen.—*Griffith's* original ticket remains on the example authenticated by T. Anderson, and shows that the plant was not collected in Mishmee.

5. ***P. thyrsiflorus***, *Nees in Wall. Pl. As. Rar.* iii. 99, and in *DC. Prodr.* xi. 321; leaves large lanceolate glabrous, thyrses elongate dense villous, calyx-teeth  $\frac{1}{4}-\frac{1}{3}$  in., corolla  $\frac{2}{3}$  in. wide-tubular 2-lipped. *T. Anders. in Journ. Linn. Soc.* ix. 506; *Kurz For. Fl.* ii. 246. *Justicia thyrsiflora*, *Roxb. Fl. Ind.* i. 114; *Wall. Cat.* 2430.

SUBTROPICAL HIMALAYA, alt. 0–4000 ft., from Gurwhal to Bhotan, very common. KHASIA MTS. and ASSAM, alt. 0–3000 ft., common. MOULMEIN; *Parish*.—DISTRIB. Ava.

A shrub, 3–7 ft. *Leaves* 7 by  $1\frac{3}{4}$  in., tapering at both ends, subentire, densely punctulate; petiole  $\frac{3}{4}$  in. *Thyrses* 4–12 in., terminal, solitary or several, or quasi-axillary on lateral branches; peduncles short; bracts  $\frac{1}{4}$  in., linear. *Calyx-tube*  $\frac{1}{8}$  in.; teeth setaceous, densely pubescent. *Corolla* closely villous, orange; tube broad from the base, curved; upper lip suberect, lower patent. *Stamens* glabrous, or slightly hairy near the base of the filaments; 2 rudiments often discernible. *Style* glabrous. *Capsule*  $1\frac{1}{4}$  by  $\frac{1}{6}$  in., subquadrangular, glabrous, 12–14-seeded. *Seeds* much compressed, orbicular in outline, densely shortly hairy, hairs elastically spreading when moistened.

6. ***P. asperulus***, *Nees in Wall. Pl. As. Rar.* iii. 99, and *Cat.* 7171, and in *DC. Prodr.* xi. 321, *excl. some syn.*; leaves elliptic acuminate at both ends glabrous, panicles linear subthyrsoid somewhat pubescent, calyx-teeth  $\frac{1}{6}$  in., corolla  $\frac{1}{3}-\frac{1}{2}$  in. tube cylindric limb much inflated ovoid. *P. vitellinus*, *T. Anders. in Journ. Linn. Soc.* ix. 507, *excl. some syn.*; *Kurz For. Fl.* ii. 246. *Justicia vitellina*, *Roxb. Fl. Ind.* i. 115, and  *Ic. Ined. in Herb. Kew.* *J. quadrangularis*, *Wall. Cat.* 2451; *Bot. Mag.* t. 2845. *J. asperula*, *Lodd. Bot. Cab.* t. 1681, *not of Wall.* *J. guttata*, *Wall. Cat.* 2431, *by mixture*. *Endopogon vitellinus*, *Nees in DC. Prodr.* xi. 723.

KHASIA MTS. and ASSAM; *Wallich, Simons*. CHITTAGONG HILLS; *Roxburgh, Clarke*.

A shrub, 3 ft., nearly glabrous. *Leaves* 5 by 2 in., undulate, scarcely puberulous or punctate; petiole  $\frac{2}{3}$  in. *Panicle* 2–4 in., terminal, usually solitary, very narrow; bracts  $\frac{1}{8}$  in., linear. *Calyx-tube*  $\frac{1}{16}$  in.; teeth setaceous, puberulous. *Corolla* suddenly curved and inflated at the summit of the tube, pubescent, pink-purple often yellow-marked; limb ringent (*Roxburgh*), segments connivent or not widely patent. *Capsule*  $\frac{2}{3}$  by  $\frac{1}{6}$  in., glabrous. *Seeds* glabrous.—This is one of the many species which *Nees* named *Thyrsacanthus indicus*.

7. ***P. guttatus***, *Nees in Wall. Pl. As. Rar.* iii. 99, and in *DC. Prodr.* xi. 321; leaves large oblong or elliptic acuminate at both ends glabrous, panicles linear dense somewhat pubescent, calyx-teeth  $\frac{1}{6}$  in., corolla  $\frac{2}{3}-\frac{3}{4}$  in. 2-lipped, segments oblong patent subrecurved. *T. Anders. in Journ.*



*Linn. Soc.* ix. 507. *Justicia guttata*, *Wall. Cat.* 2431 chiefly, and *Pl. As. Rar.* i. 24, t. 28; *Bot. Reg.* t. 1334.

KHASIA MTS., alt. 2-4000 ft.; on the southern face common, *Wallich, &c.* BHOTAN (*T. Anderson*).

*Leaves* often 9 by 3 in.; petiole  $1\frac{1}{2}$  in. *Panicles* 3-6 by 1 in., terminal or quasi-terminal, solitary or 2-3 together. *Corolla* pubescent; upper lip suberect, shortly 2-lobed, yellow; lower deeply 3-lobed, segments patent subrecurved, green with purple spots. *Capsule*  $1\frac{1}{4}$  by  $\frac{1}{2}$  in., 12-seeded.—Confused with *P. asperulus*, but the leaves are larger, the corolla larger and altogether a different shape and colour. Nees doubts whether *Bot. Reg.* t. 1334 belongs here, but it is a most faithful picture.

8. **P. elongatus**, *T. Anders. in Journ. Linn. Soc.* ix. 508; leaves long-petioled ovate acuminate at both ends glabrous, spikes elongate slender, corolla  $\frac{1}{2}$  in. tubular 2-lipped. *Kurz For. Fl.* ii. 246.

TENASSERIM; Amherst, *Falconer* (*T. Anderson*).

An undershrub, 1-2 ft.; stem terete, primrose. *Leaves* including the petiole 4-6 by  $2\frac{1}{2}$  in. *Spikes* nearly a foot, most terminal trichotomously branched or axillary simple; flowers distichously opposite, sessile, solitary; bracts  $\frac{1}{2}$  in., ovate, acute; bracteoles subulate. *Calyx* deeply 5-partite, segments linear. *Corolla-tube* straight, pubescent, lower lip hirsute within. *Stamens* of the genus. *Capsule*  $\frac{4}{5}$  in., clavate, subtetragonous, glabrous, 8-seeded (*T. Anderson*).—Not seen.

\*\* *Cymes or short panicles axillary.*

9. **P. pubinervius**, *T. Anders. in Journ. Linn. Soc.* ix. 508; leaves elliptic or ovate acute at both ends pubescent on the nerves beneath, cymes axillary, calyx-segments woolly within nearly glabrous on the back.—*Phlogacanthus* sp. n. 7, *Herb. Ind. Or. H. f. & T.*

SIKKIM, alt. 5-7000 ft., *J. D. H.* BHOTAN; *Griffith.* ASSAM and KHASIA Mts., alt. 3-5000 ft., frequent, *Griffith, &c.*

A much-branched shrub, 3-8 ft. diam. *Leaves*  $3\frac{1}{2}$  by  $1\frac{1}{2}$  in., subentire, puberulous or glabrate above; petiole  $\frac{2}{3}$  in. *Cymes* numerous, 1 in. diam., subsessile, nearly glabrous; pedicels often  $\frac{1}{4}$  in., ebracteolate at the apex; bracts at their base minute. *Calyx-tube*  $\frac{1}{16}$  in.; teeth  $\frac{1}{6}$  in., linear-lanceolate, appearing woolly on the margins. *Corolla*  $\frac{1}{2}$  in., mature puberulous, tubular-inflated nearly from the base, red; limb small, segments ovate subconnivent. *Stamens* 2, glabrous; anthers far-exserted. *Ovary* glabrous. *Capsule* elongate, many-seeded.—Nees marked this *Graptophyllum hortense*.

10. **P. Jenkinsii**, *Clarke*; leaves elliptic acute at both ends glabrous, racemes or small panicles axillary grey pubescent, calyx-segments uniformly grey pubescent.

ASSAM; *Jenkins*.—DISTRIB. Bhamo.

*Branches* elongate, stout, quadrangular, glabrous, puberulous upwards. *Leaves*  $6\frac{1}{2}$  by  $2\frac{3}{4}$  in., subentire; petiole  $1\frac{1}{2}$  in. *Racemes* 1- $2\frac{1}{2}$  in., dense-fl., sometimes compound; pedicels 0- $\frac{1}{6}$  in., closely grey pubescent. *Calyx-tube*  $\frac{1}{2}$  in., segments  $\frac{1}{4}$  in., linear-lanceolate. *Corolla* nearly as of *P. pubinervius*, but rather more pubescent; appears to have been orange. *Stamens* 2, glabrous; anthers very shortly exserted. *Ovary* glabrous, 12-ovulate; style glabrous. *Capsule* not seen.—The calyx and corolla of this species are very like those of *P. pubinervius*, but the habit is more that of *P. thyrsiflorus*. Nees marked this *Thyrsacanthus indicus*, regardless of the 2 stamens, and 12 ovules.

## XXXII. CYSTACANTHUS, *T. Anders.*

*Corolla* tubular, ventricose upwards; segments 5, ovate, scarcely patent.



Otherwise as *Phlogacanthus*.—Species 4, in Pegu, Tenasserim, and Cochin China.

1. **C. paniculatus**, *T. Anders. in Journ. Linn. Soc.* ix. 458; leaves elliptic acuminate at both ends puberulous on the nerves beneath, panicle terminal ovate-oblong somewhat lax hairy, calyx-segments  $\frac{1}{4}$ – $\frac{1}{3}$  in.

MOULMEIN; *T. Lobb*.

*Branches* elongate, stout, tetragonous, glabrous. *Leaves*  $5\frac{1}{2}$  by  $2\frac{1}{4}$  in., undulate; petiole hardly  $\frac{1}{2}$  in. *Panicle* 7 by 3 in., many-fl.; bracts at the main division 1 by  $\frac{1}{4}$  in., glabrous, foliaceous, otherwise very hairy. *Sepals* linear-oblong. *Corolla* 1 in., upper half ventricose, hairy, violet (*Lobb*); segments ovate, suberect. *Anthers* included. *Capsule*  $1\frac{1}{4}$  by  $\frac{1}{3}$  in., very hairy, 16-seeded. *Seeds* lenticular, densely shortly hairy; hairs standing out when wetted.

2. **C. cymosus**, *T. Anders. in Journ. Linn. Soc.* ix. 458; leaves elliptic or lanceolate pubescent on both surfaces, cymes axillary few-fl. *Phlogacanthus cymosus*, *Kurz For. Fl.* ii. 246.

BURMA; *Brandis*.

A shrub; branches puberulous, internodes short. *Leaves* 3–4 by  $\frac{3}{4}$ – $1\frac{1}{2}$  in., acute at both ends, softly silky beneath; petiole 1 in. *Cymes* viscous-hairy; pedicels  $\frac{1}{4}$  in. *Sepals*  $\frac{2}{3}$  in., linear-oblong, very hairy. *Corolla*  $1\frac{1}{4}$  in., inflated upwards, viscous; lobes small, subequal. *Capsule*  $1\frac{1}{4}$  by  $\frac{1}{4}$  in., tomentose.—Mostly copied from *T. Anderson*, the *Kew* example being imperfect; but it is sufficient to show that the species is congeneric with *C. paniculatus*, which *Bentham* (*Gen. Pl.* ii. 1098) doubts.

3. **C. pulcherrimus**, *Clarke*; leaves large elongate-lanceolate glabrous, panicle terminal linear, calyx-teeth  $\frac{1}{8}$ – $\frac{1}{6}$  in. *Loxanthus Gomezii*, *Nees in DC. Prodr.* xi. 322 (as to the *Mergui* plant). *Phlogacanthus pulcherrimus*, *T. Anders. in Journ. Linn. Soc.* ix. 507; *Kurz For. Fl.* ii. 246.

MERGUI; *Griffith* (*Kew Distrib.* n. 6155, partly). MOULMEIN; *Parish*. TENASSERIM; *Beddome*.

A shrub. *Leaves* 8 by 2 in., acuminate at both ends, subentire; petiole 1 in. *Panicle* 4–18 by  $\frac{3}{4}$  in., nearly glabrous; proper bracts small, but foliaceous; other bracts  $\frac{3}{4}$  by  $\frac{1}{4}$  in. are sometimes scattered throughout the panicle; pedicels  $0$ – $\frac{1}{6}$  in. *Calyx-tube*  $\frac{1}{16}$  in., teeth linear, slightly or densely pubescent. *Corolla* 1 in., tubular-funnel-shaped, somewhat curved, nearly glabrous, appears to have been green-yellow with purple spots; lobes ovate, erect-patent. *Filaments* very hairy at the base; connective minutely hispid on the back. *Capsule*  $\frac{3}{4}$ –1 in., stout, glabrous.—This was no part of the original *Loxanthus Gomezii*, *Nees* (*in Wall. Pl. As. Rar.* iii. 99).

VAR. ? *bracteosa*; panicle ashy pubescent, bracts and bracteoles numerous large oblong or linear-spathulate, corolla straight subsymmetric.—Pegu; *Brandis*. Tenasserim, Mooleyit, *Beddome*. Mergui, *Griffith* (*Herb. Propr.* ii. 875).

4. **C. insignis**, *Clarke*; leaves large broadly elliptic acute at both ends glabrous, panicle terminal dense slightly pubescent, calyx-teeth  $\frac{1}{6}$  in. *Phlogacanthus insignis*, *Kurz in Flora* 1870, 364, and in *Journ. As. Soc.* 1870, ii. 79, and *For. Fl.* ii. 246.

PEGU; in tropical forests up to 3000 ft., *Kurz, Brandis*.

An evergreen meagre shrub, 3–5 ft.; stem tetragonous, white. *Leaves* 9 by  $4\frac{1}{4}$  in.; petiole 1 in. *Panicles* 2–4 in., sessile, compound oblong; bracts minute, linear, a few foliaceous  $\frac{3}{4}$  in. sometimes interspersed. *Corolla*  $1\frac{1}{4}$  in., ventricose for  $\frac{2}{3}$  its length, dark violet golden villous in the throat (*Kurz*); lobes  $\frac{1}{3}$  in., broadly lanceolate, subequal, nearly erect. *Filaments* and *style* glabrous. *Capsule*  $1\frac{1}{3}$  by  $\frac{1}{3}$  in., cylindric, glabrate, 10-seeded. *Seeds*  $\frac{1}{8}$ – $\frac{1}{6}$  in. diam., compressed, orbicular, fulvous-hairy.



XXXIII. **DIOTACANTHUS**, *Benth.*

Corolla-tube short, limb large ventricose 2-lipped. Otherwise as *Phlogacanthus* or *Cystacanthus*.—Species 2, S. Malabarica.

1. **D. grandis**, *Benth. in Gen. Pl.* ii. 1101; glabrous, leaves large lanceolate or obovate-lanceolate, panicles axillary peduncled many-fld. mostly exceeding the leaves, corolla crimson. *Phlogacanthus grandis*, *Bedd. Ic. Pl. Ind. Or.* t. 179.

TINNEVELLY and TRAVANCORE, alt. 3–4000 ft.; *Beddome*.

A shrub, 8–12 ft. *Leaves* 7 by  $2\frac{3}{4}$  in., attenuate at both ends, undulate, obscurely crenate; nerves 12 pair; petiole  $\frac{3}{4}$  in. *Peduncles* 2–5 in., stout, compressed; panicles often 4–8 in.; bracts at its divisions  $\frac{2}{3}$  in., linear; proper bracts  $\frac{1}{8}$  in., linear. *Sepals*  $\frac{1}{4}$  in., linear. *Corolla* minutely pubescent, tube  $\frac{1}{6}$  in., limb  $\frac{3}{4}$  in.; upper lip emarginate, lower shortly 3-lobed. *Filaments* as long as the corolla, stout, minutely scabrous. *Style* minutely pubescent, subentire. *Capsule* 1 by  $\frac{1}{8}$ – $\frac{1}{6}$  in., 24-seeded. *Seeds* much compressed, orbicular in outline, minutely crisped-pubescent.

2. **D. albiflorus**, *Benth. in Gen. Pl.* ii. 1101; nearly glabrous, leaves elliptic acute at both ends, panicles axillary peduncled few-fld. shorter than the leaves, corolla pure white. *Phlogacanthus albiflorus*, *Bedd. Ic. Pl. Ind. Or.* t. 180.

S. TINNEVELLY, alt. 3–5000 ft., and near Courtallum, *Beddome*.

A shrub, 6–10 ft. *Leaves* 5 by  $1\frac{3}{4}$  in., subentire; nerves 7 pair; petiole  $\frac{1}{8}$ – $\frac{1}{4}$  in. *Peduncles* 1–2 in., slender; panicles 1– $1\frac{1}{2}$  in., depressed corymbiform. *Calyx*, *corolla* and *capsule* nearly as of *D. grandis*.—*Beddome* describes the filaments as “much dilated below, articulated near the apex, quite black above the articulation;” this character being remarkable in the *Acanthaceæ*, Mr. Bentham refers to (*Gen. Pl.* ii. 1101) the articulation of the filaments. But in a prolonged examination of the very filaments supplied by *Beddome* no articulation whatever has been made out by myself and Prof. Oliver.

XXXIV. **LEPIDAGATHIS**, *Willd.*

Herbs or undershrubs, with often pubescent bracts or leaves. *Leaves* entire or crenate-serrate. *Flowers* sessile, usually capitate, sometimes opposite or solitary; heads terminal or axillary, dense (rarely lax), usually 1-sided, often fascicled; bracts usually larger than the calyx-segments, rarely small; bracteoles narrower than the bracts. *Calyx* deeply 5-lobed; segments unequal, the 2 anterior more or less connate (calyx 4-partite). *Corolla* small (except in *L. longifolia*), tubular, suddenly ventricose in the middle, 2-lipped; lower lip 3-lobed, patent, usually spotted. *Stamens* 4, didynamous; anthers all 2-celled; cells oblong, muticous, parallel, or one lower somewhat divergent. *Stigma* capitellate, minutely bifid or entire. *Capsule* 2- or 4-seeded, elongate conoid or oblong. *Seeds* compressed, ovate-oblong, or orbicular, hairy.—Species 50 tropical, whereof 2 only are American.

*Lepidagathis falcata* & *dulcis*, *Wall. Cat.* 7166, 7167, came from Ava, outside the bounds of British India.

Sect. 1. *Capsule* 2-seeded, elongate-conic, dorsally scarious, thin, irregularly tearing, only ultimately 2-valved from the subsolid tip. *Seeds* ovate-lanceolate, with very long hair spreading elastically when wet, very mucilaginous.



\* *Spikes chiefly aggregated, globose, near the base of the stem.*

1. ***L. cristata***, Willd. *Sp. Pl.* iii. 400; leaves linear or oblong nearly glabrous, bracts and bracteoles elliptic ovate or obovate suddenly spinose-acuminate, sepals elliptic or obovate suddenly spinulose in fruit thickened very hairy upwards. *Roxb. Cor. Pl.* iii. 63, t. 267, and *Fl. Ind.* iii. 53; *Wall. Cat.* 2421, *chiefly*; *Nees Monogr. Lepidag.* 25, and in *Wall. Pl. As. Rar.* iii. 96, and in *DC. Prodr.* xi. 256, *Var. a only*; *Wight Ill.* t. 164 b, fig. 5, and *lc.* t. 455; *Dalz. & Gibs. Bomb. Fl.* 191; *T. Anders. in Journ. Linn. Soc.* ix. 494. *L. Shuteri*, *T. Anders. l. c.*—*Lepidagathis* sp. n. 18, *Herb. Ind. Or. H. f. & T.*

COROMANDEL, in the tropical region, frequent; *Rottler*, *Wight* (*Herb. Propr.* n. 1971), &c.

*Rootstock* perennial; stems 6–18 in., branched, procumbent, quadrangular, puberulous or slightly pubescent. *Leaves* 1 by  $\frac{1}{4}$  in., sessile, lineolate above, minutely scabrid-pubescent on the nerves beneath or glabrate. *Inflorescence* subradical, globose; one or two smaller heads sometimes added on the lower part of the leafy branches; bracts  $\frac{1}{3}$  in., rigid in fruit; bracteoles membranous, hairy, spinescent. *Calyx* sub-4-partite, one segment bifid; segments upwards thickened, oblong obtuse with a mucro, hairy, in fruit densely hairy. *Corolla*  $\frac{1}{3}$  in., densely hairy in bud, white with brown or purple spots in the palate. *Stamens* glabrous; anther-cells one slightly above the other, papillose-ciliate. *Ovary* glabrous. *Capsule*  $\frac{1}{4}$  in.—*T. Anderson's* specimens of *L. Shuteri* are merely the fruiting states of *L. cristata*, with particularly glabrous leaves, &c. His description again appears drawn up chiefly from *L. mitis*. The older botanists did not separate *L. cristata* from the 2 following, and Willdenow's original description does not mention the bracts, and may belong to all of the three. So Roxburgh's picture cited shows obtuse bracts; but his description says "bracts lanceolate ciliated pointed," which may have been taken from *L. Hookeri*.

*VAR. rupestris*; stem pubescent, leaves elliptic pubescent on both surfaces. *L. rupestris*, *Nees in Wall. Pl. As. Rar.* iii. 96, and in *DC. Prodr.* xi. 256; *T. Anders. in Journ. Linn. Soc.* ix. 494.—Coromandel (?), *Wight* (*Herb. Propr.* n. 1970).

2. ***L. Hamiltoniana***, *Wall. Cat.* 2422; leaves linear or narrowly oblong nearly glabrous, bracts lanceolate spinescent patently ciliate upwards, calyx-lobes lanceolate spinescent not thickened upwards. *Nees Monogr. Lepidag.* 23, and in *Wall. Pl. As. Rar.* iii. 96, and in *DC. Prodr.* xi. 255. *L. Beddomei*, *T. Anders. in Journ. Linn. Soc.* ix. 499.

BEHAR, alt. 1000 ft.; R. Sone at Rotasghur, *J. D. H.*; Bhagulpore, *Hamilton*. BUNDELKUND; *Edgeworth*. JUBBULPORE; *Beddome*. CHOTA NAGPORE, alt. 1–3000 ft., plentiful.

Closely resembling *L. cristata* in habit, leaves and inflorescence. *Bracts* long-tapering upwards, with long white hairs on their margins. *Calyx-segments* tough-membranous. *Corolla* with adpressed straight white hairs, not densely furred as in *L. cristata*.—The flowers in *Beddome's* example are detached; *T. Anderson* describes them as terminal, which is certainly not the case.

3. ***L. mitis***, *Dalz. in Hook. Kew Journ.* iii. 226; leaves oblong pubescent scabrous on the nerves beneath, flower-heads not prickly, bracts softly membranous obtuse or shortly acute. *Dalz. & Gibs. Bomb. Fl.* 191.

W. DECCAN PENINSULA; Concan, Belgaum, Mangalore, *Wight*, *Stocks*, &c.

Closely allied to *L. cristata*. *Stems* usually acutely quadrangular, puberulous or pubescent. *Leaves*  $1\frac{1}{4}$  by  $\frac{1}{4}$ – $\frac{1}{2}$  in., broader than in the two preceding species, often distinctly scabrid-ciliate. *Bracts* chaffy, purple or yellow.—Seems well separated from *L. cristata*, but the bracts pass insensibly into the following var.

*VAR. subarmata*; bracts lanceolate soft or subspinescent or rigidly spinous. *L. cristata* var. *latifolia*, *Nees in DC. Prodr.* xi. 256; *Dalz. & Gibs. Bomb. Fl.* 191. *L.*



*cristata*, Wall. Cat. 2421, letter C. *L. rupestris*, Bedd. Ic. Pl. Ind. Or. t. 229.—Malabar; frequent, Wight, &c.—This form differs from *L. Hamiltoniana* by its much wider usually ciliate leaves.

\*\* *Spikes mostly axillary scattered.*

4. ***L. trinervis***, Nees Monogr. *Lepidag.* 21, and in Wall. Pl. As. Rar. iii. 96, and in DC. Prodr. xi. 254; leaves linear or linear-lanceolate entire glabrous 3-nerved, bracts ovate or obovate spinose-cuspidate glabrous or cobweb-ciliate, corolla white. T. Anders. in Journ. Linn. Soc. ix. 495. *Barleria*? *trinervis*, Wall. Cat. 2500.

Dry hills of CENTRAL INDIA, alt. 1–2000 ft.; from Bombay Ghauts, Dalzell, and Goojerat, Stocks, to the Kymore Hills, J. D. H., and Chota Nagpore. SIKKIM (probably base of the hills), Herb. Griffith. N.W. HIMALAYA? Herb. Falconer.

*Rootstock* woody; stems numerous, 5–10 in. Leaves  $1\frac{1}{4}$  by  $\frac{1}{8}$ – $\frac{1}{4}$  in., sessile, muticous, lineolate above; midrib beneath distinct, with 2 slender nerves parallel to it near the margins. *Spikes*  $\frac{2}{3}$  in., ovoid, often numerous, generally near the base of the stems, sometimes all conglomerated into a subradical globe as in *L. cristata*; bracts  $\frac{1}{2}$ – $\frac{3}{4}$  in., nearly half their length occupied by the subsquarrose cusp; bracteoles linear-lanceolate, softly membranous. *Calyx* non-spinescent. *Corolla* and *capsule* nearly as of *L. cristata*.

VAR. *asperrima*, T. Anders. ms.; leaves  $\frac{1}{3}$  by  $\frac{1}{12}$  in. mucronate very scabrous. *Lepidagathis* sp. n. 21, Herb. Ind. Or. H. f. & T.—Concan; Stocks.—Stem 6 in., branched, stoutly lignescent; branches numerous, internodes very short.

5. ***L. lutea***, Dalz. in Hook. Kew Journ. ii. 139; leaves linear or linear-lanceolate nearly glabrous 3-nerved, outer bracts often stout elongate spinous inner much smaller, corolla yellow. Dalz. & Gibs. Bomb. Fl. 190; T. Anders. in Journ. Linn. Soc. ix. 495.

BOMBAY GHAUTS; Dalzell, Stocks, Law.

*Rootstock* woody; stems 6–20 in., quadrangular, pubescent or nearly glabrous. Leaves 2 by  $\frac{1}{4}$  in., sessile, minutely hairy above, glabrous beneath. *Spikes* usually 1–3 together in many of the axils, and also a subradical congested globe, pubescent; outermost bract of each spike often 1–2 in. with a very stout bayonet-like tip; inner bracts  $\frac{1}{3}$ – $\frac{1}{2}$  in., membranous, acute or shortly spinescent. *Calyx* shortly spinescent or innocuous. *Corolla*  $\frac{4}{5}$  in. (fide Dalzell); but appears only  $\frac{1}{2}$  in. in the dried specimens, much as of *L. cristata*.

6. ***L. spinosa***, Wight; Nees in Wall. Pl. As. Rar. iii. 97, and Monogr. *Lepidag.* 32, and in DC. Prodr. xi. 258; leaves obovate spinous-mucronate mostly entire glabrous, bracts broadly oblong acuminate spinescent, T. Anders. in Journ. Linn. Soc. ix. 495. *Barleria*? *spinosa*, Wall. Cat. 2497. *Acanthus mucronatus*, Heyne in Herb. Rottler.

CARNATIC and MYSORE; Rottler, Wight, Hamilton, &c.

A prostrate, much-branched perennial, 6–20 in. Leaves  $\frac{1}{2}$  by  $\frac{1}{4}$ – $\frac{1}{3}$  in., sessile, usually with one spine only at the tip, rarely 1–2 spines on the margins added. Heads  $\frac{1}{2}$ – $\frac{3}{4}$  in., scattered, ovoid, few-fl.; outer barren bracts numerous,  $\frac{2}{3}$  in. including the strong spine, rigid; inner bracts and bracteoles softer; calyx (or its inner segments at least) villous muticous. *Corolla* and *capsule* as of *L. cristata*.

7. ***L. pungens***, Nees in Wall. Pl. As. Rar. iii. 97, and in Monogr. *Lepidag.* 33, and in DC. Prodr. xi. 58; leaves ovate spinous-serrate glabrous, bracts lanceolate or ovate lanceolate spinous-mucronate. Wight Ic. t. 456; T. Anders. in Journ. Linn. Soc. ix. 495. *Barleria*? *pungens*, Wall. Cat. 2498.

S. MADRAS; Rottler, Wight, G. Thomson.



Nearly all the leaves with 2-3 strong spines on each margin; otherwise closely resembling *L. spinosa*.

8. ***L. clavata***, Dalz. in Hook. Kew Journ. ii. 340; leaves sessile ovate subentire spinous-mucronate glabrescent, spikes solitary terminal oblong or subclavate, bracts sub-4-ranked resembling the leaves but woolly. Dalz. & Gibs. Bomb. Fl. 191; T. Anders. in Journ. Linn. Soc. ix. 495.

BOMBAY GHATS and SYHADREE MTS.; Dalzell, Stocks.

Rootstock stout, woody; stems several 8-12 in., erect, undivided or rarely divided, lower leaves caducous. Leaves 1 in., rigid, plicate, squarrose, slightly ciliate or glabrate. Spikes 1-3 in., dense, harsh; lower bracts altogether as the leaves, upper smaller, becoming very woolly; bracteoles resembling the calyx-segments. Calyx  $\frac{1}{2}$  in.; segments unequal, silky. Corolla  $\frac{2}{3}$  in. as of *L. cristata*, but (fide Dalzell) rose. Capsule and seeds as of *L. cristata*.

9. ***L. prostrata***, Dalz. in Hook. Kew Journ. ii. 138; leaves sessile ovate subentire spinous-mucronate pubescent, spikes terminal on short lateral branches ovate or oblong, bracts resembling the leaves. Dalz. & Gibs. Bomb. Fl. 190; T. Anders. in Journ. Linn. Soc. ix. 495.

W. DECCAN PENINSULA; Concan, Dalzell, Stocks; Canara, Ritchie. SUB-TROPICAL W. HIMALAYA; Kangra, alt. 1-4000 ft., Clarke.

Rootstock woody; branches 6-15 in., prostrate, much branched pubescent. Leaves  $\frac{1}{2}$ -1 in., rigid, plicate, squarrose, strongly nerved. Spikes  $\frac{1}{2}$ -2 in., in appearance axillary, dense, varying much in length; lower bracts as the leaves, upper smaller. Calyx  $\frac{1}{3}$ - $\frac{1}{2}$  in., villous; inner segments smaller, not spinescent. Corolla and capsule as of *L. clavata*, to which this species appears closely allied, though differing so greatly in habit.

10. ***L. diffusa***, Clarke; leaves sessile linear or elliptic entire muticous glabrescent, spikes ovate axillary often clustered, bracts lanceolate acuminate spinescent. *Barleria diffusa*, Wight in Herb. Propr.

DECCAN PENINSULA; Wight; Bellary, Beddome.

Rootstock woody; branches 3-10 in., prostrate, much-divided, nearly glabrous. Leaves 1 by  $\frac{1}{2}$ - $\frac{1}{3}$  in., varying considerably on the same plant, sometimes acute almost mucronate. Spikes  $\frac{1}{2}$ - $\frac{3}{4}$  in., dense, hairy, mostly towards the upper ends of the stems, really terminal on much-shortened lateral branches; bracts  $\frac{1}{3}$  in. Calyx 4-partite, villous; 2 outer segments lanceolate undivided, inner narrower. Corolla  $\frac{1}{2}$  in.—Wight doubtless referred this to *Barleria* because both the outer larger calyx-segments are undivided. The corolla, stamens and capsule are altogether as of *L. cristata*.

Sect. 2. Capsule 4-seeded, oblong, early 2-valved from the apex. Seeds ovate or orbicular, with very short hairs elastic when wetted.

\* Leaves entire or undulate.

11. ***L. rigida***, Dalz. in Hook. Kew Journ. ii. 341; softly hairy, leaves linear-lanceolate muticous, spikes oblong dense terminal often appearing clustered, bracts narrowly ovate shortly spinescent. Dalz. & Gibs. Bomb. Fl. 191; T. Anders. in Journ. Linn. Soc. ix. 495.

BOMBAY GHATS; Dalzell, Stocks, &c. SCINDE (T. Anderson).

Suffruticose, 1-2 ft. (at least), erect, softly hairy. Leaves  $3\frac{1}{2}$  by  $\frac{1}{2}$  in., attenuate at both ends, glandular-pubescent on both surfaces; petiole indistinct. Spikes  $\frac{1}{2}$ -2 $\frac{1}{2}$  in., often appearing as in terminal clusters on shortened lateral branches; bracts  $\frac{1}{3}$ - $\frac{1}{2}$  in., entire, rigid. Corolla  $\frac{1}{2}$  in., yellow-white. Capsule  $\frac{1}{2}$  in., 4-seeded. Seeds  $\frac{1}{12}$  in. diam.—The inflorescence, capsule and seeds approach those of *L. hyalina*.



12. **L. cuspidata**, *Nees in Wall. Pl. As. Rar.* iii. 97, and *Monogr. Lepidag.* 31, and in *DC. Prodr.* xi. 258; leaves elliptic or ovate attenuate at both ends puberulous, spikes dense or very lax pubescent, bracts ovate cuspidate 3-nerved. *T. Anders. in Journ. Linn. Soc.* ix. 495; *Bedd. Ic. Pl. Ind. Or.* t. 227. *Ruellia cuspidata*, *Wall. Cat.* 2405.

TROPICAL INDIA; extending from W. Himalaya, *Falconer, Edgeworth*, to COORG, *Rottler*, and MALABAR from the plains nearly to the top of the Ghauts.

Shrubby; stems 1-2½ ft., erect or diffuse, glabrous or pubescent towards the apex. *Leaves* of the main stem 4½ by 1¾ in., muticous; petiole ¼-½ in.; on the lateral flowering branches the leaves are mostly 1 in., sessile, mucronate. *Spikes* 1 in., dense, or 6 in. lax with the flowers in distinct opposite pairs; bracts ⅔ by ⅓ in. *Calyx* ½ in., 5-partite. *Corolla* scarcely ½ in., whiteish with purple spots. *Capsule* 4-seeded.

13. **L. calycina**, *Hochst.*; *Nees in DC. Prodr.* xi. 252; leaves petioled oblong entire nearly glabrous, spikes numerous small ovoid sparingly scabrid puberulous, bracts obovate 3-nerved aristate not spinescent. *T. Anders. in Journ. Linn. Soc.* ix. 496; *Boiss. Fl. Orient.* iv. 525. *L. strobilifera*, *Stocks in Hook. Kew Journ.* iv. 177.

SCINDE; *Stocks*.—DISTRIB. Beloochistan, Abyssinia.

A small, erect, rigid, much-branched undershrub. *Leaves* 1½ by ⅓ in., lineolate, obscurely ciliate-pubescent; petiole ⅛-⅙ in. *Heads* ¾ in., appearing sessile often conglomerate; bracts ⅓ by ⅓ in., scarious, 3-5 nerved, scabrid-puberulous on the nerves; bracteoles ¼ in., linear, ciliate. *Calyx* 4-partite; 2 outer segments ⅓-½ in. broad, scarious, nerved, one bifid half-way down; 2 inner segments ¼-⅓ in., linear. *Corolla* ½ in., white, lower lip purple-spotted. *Capsule* nearly ½ in., 4-seeded.

14. **L. chlorostachya**, *Nees in DC. Prodr.* xi. 256; leaves large petioled elliptic acuminate at both ends glabrous, spikes axillary oblong dense ciliate scarcely pubescent, bracts and bracteoles narrowly lanceolate mucronate scarcely spinescent. *T. Anders. in Journ. Linn. Soc.* ix. 496.

MERGUI; *Griffith* (*Kew Distrib.* n. 6141).

Shrubby, erect. *Leaves* 6½ by 1¾ in., entire membranous; petiole ½-1 in. *Spikes* 2 by ½ in., subsessile, mostly solitary in each axil sometimes 2 together, erect, 1-sided or subsymmetric; bracts ½ by ⅓ in., white ciliate, subsymmetric or in the 1-sided spikes falcate; bracteoles similar rather smaller. *Calyx* 5-partite; segments linear-lanceolate, nearly similar. *Corolla* ½ in., and *stamens* as of *L. hyalina*. *Capsule* oblong, 4-seeded.

15. **L. subuninervia**, *Clarke*; spikes linear-oblong pubescent, bracts linear-lanceolate sub-1-nerved ciliate mucronate. *Neuracanthus subuninervius*, *Kurz in Journ. As. Soc.* 1873, pt. ii. 95.

PROME HILLS; *Kurz*.

The fragment on which *Kurz* founded this species is the leafless base of a stem, whence arise 2 erect spikes, very similar to those of *L. chlorostachya*, but pubescent as well as ciliate, and the bracts rather smaller. *Stamens* 4; anthers all 2-celled, cells superposed; filaments slightly bearded at the apex. *Style* glabrous, stigma small minutely bifid.—The stamens and bracts are not those of a *Neuracanthus*; and the fragmentary solitary specimen is so like *L. chlorostachya* that it might be merely a burnt-down hill specimen of it.

16. **L. purpuricaulis**, *Nees in Wall. Pl. As. Rar.* iii. 96, and *Monogr. Lepidag.* 27, and in *DC. Prodr.* xi. 257; leaves lanceolate or ovate-lanceolate pubescent, spikes axillary sessile solitary or clustered oblong hairy, bracts lanceolate or ovate-lanceolate mucronate striate, calyx sub-5-partite one segment broad the other 4 very narrow. *T. Anders. in Journ. Linn. Soc.* ix.



496. *L. striata*, *Nees in Wall. Pl. As. Rar.* iii. 96, and *Monogr. Lepidag.* 26, and in *DC. Prodr.* xi. 257, and in *Wall. Cat.* 7165. *Ruellia mucronata*, *Wall. Cat.* 2366, sheets  $\beta$ ,  $\delta$ ,  $\zeta$ .

SUBTROPICAL W. HIMALAYA; Hooshianpur, *Aitchison*; Hurdwar, *Wallich*; Kumaon, *Strachey & Winterbottom*. CHOTA NAGPORE; Parasnath, *Edgeworth*; Rajmahl, *Watt*. PROME HILLS; *Wallich*.

*Stems* herbaceous, 8–24 in., suberect or diffuse, glabrous or hairy, often purple. *Leaves* 1–5 in., sometimes in unequal pairs; larger attenuate at both ends glabrate, smaller subovate more pubescent. *Spikes*  $\frac{1}{2}$ – $1\frac{1}{2}$  in., dense; bracts  $\frac{1}{3}$  by  $\frac{1}{6}$  in.; bracteoles  $\frac{1}{4}$  in., linear-falcate. Large *sepal*  $\frac{1}{3}$ – $\frac{1}{2}$  by  $\frac{1}{5}$  in.; 2 next  $\frac{1}{3}$  in., linear-lanceolate, 2 inner linear. *Corolla* and *capsule* as of *L. hyalina*, from which this species differs very little.

17. ***L. dulcis***, *Nees in Wall. Pl. As. Rar.* iii. 96, and *Monogr. Lepidag.* 30, and in *DC. Prodr.* xi. 257, and in *Wall. Cat.* 7167; leaves petioled elliptic narrowed at both ends pubescent on the nerves beneath, spikes axillary ovoid or somewhat elongate hairy, bracts elliptic scarious, calyx sub-5-partite, outer segment broad. *T. Anders. in Journ. Linn. Soc.* ix. 496. *Ruellia dulcis*, *Wall. Cat.* 7167.

PROME HILLS; *Wallich*. PEGU; *Kurz*.

Annual *stems* 6–12 in., subundivided, flexuose, in appearance procumbent, somewhat pubescent. *Leaves*  $3\frac{1}{2}$  by  $1\frac{1}{4}$  in., undulate, soon glabrate above; petiole  $\frac{1}{4}$ – $\frac{1}{2}$  in. *Spikes* 1 by  $\frac{1}{2}$  in., mostly solitary opposite, 1-sided; bracts  $\frac{1}{3}$  by  $\frac{1}{6}$  in., somewhat obovate, apiculate not spinescent, nerved, scarious, ciliate; bracteoles similar, but rather smaller, subfalcate. Outer *sepal* nearly  $\frac{1}{2}$  by  $\frac{1}{4}$  in., obovate, nerved, scarious, ciliate; 2 next  $\frac{1}{3}$  by  $\frac{1}{8}$  in. falcate, 2 inner  $\frac{1}{4}$  in. linear. *Corolla*  $\frac{1}{2}$  in. (Nees). *Capsule* exceeding  $\frac{1}{4}$  in., 4-seeded.

18. ***L. scariosa***, *Nees in Wall. Pl. As. Rar.* iii. 95, and *Monogr. Lepidag.* 15, and in *DC. Prodr.* xi. 251; leaves petioled ovate furfuraceous-pubescent, spikes mostly terminal ovoid dense, bracts narrowly obovate mucronate, outer calyx-segment large obovate scarious. *Wight Ic.* t. 457; *T. Anders. in Journ. Linn. Soc.* ix. 497. *L. terminalis*, *Hochst.*; *Nees in DC. Prodr.* xi. 251. *Ruellia scariosa*, *Wall. Cat.* 2354.

S. DECCAN PENINSULA; Coimbatore, *Wight*; S. Canara, *Beddome*.—DISTRIB. Abyssinia.

A small undershrub; branches numerous, much-divided, stellately woolly or glabrate. *Leaves* 2 by  $1\frac{1}{4}$  in., hardly acute, undulate; petiole 0– $\frac{1}{2}$  in. *Spikes* 1 in. diam., solitary or 2–3, conglomerate, all at the tips of the branches; bracts  $\frac{1}{3}$  in., ciliate, scariose; bracteoles  $\frac{1}{3}$  in., nearly linear. *Calyx*  $\frac{1}{2}$  in., sub-5-partite; outer segment  $\frac{1}{4}$  in. broad; 2 next  $\frac{1}{12}$  in. broad, 2 innermost linear. *Corolla*  $\frac{1}{2}$  in. and upwards. *Capsule*  $\frac{1}{3}$  in., 4-seeded.—T. Anderson, as well as Nees, keeps *L. terminalis* distinct; but the only difference is that the corolla in *L. terminalis* is  $\frac{3}{4}$  in., whereas in *L. scariosa* it must not exceed  $\frac{2}{3}$  in.

19. ***L. simplex***, *T. Anders. in Journ. Linn. Soc.* ix. 497; leaves sessile narrowly oblong glabrous, spikes terminal solitary ovoid or ellipsoid, bracts and bracteoles narrowly obovate white-ciliate, calyx sub-5-partite, segments lanceolate submucronate.

TENASSERIM; *Helper* (Kew Distrib. n. 6140).

*Stem* simple, 4–10 in., erect, glabrous, 4-angular. *Leaves* 1 by  $\frac{1}{3}$  in., rigid, obtuse, entire, shining. *Spike*  $\frac{1}{2}$ –1 in., sessile, 1-sided; bracts  $\frac{1}{3}$  by  $\frac{1}{6}$  in., scarcely acute, scarious; bracteoles similar to the bracts, but rather smaller. *Calyx*  $\frac{1}{4}$ – $\frac{1}{3}$  in., white ciliate; 2 outer segments oblong, subentire, 2 inner linear. *Corolla* not seen. *Capsule*  $\frac{1}{4}$  in., oblong, 4-seeded. *Seeds* densely, elastically hairy.—This looks like a form of *L. hyalina* var. *semiherbacea*.



20. **L. hyalina**, *Nees in Wall. Pl. As. Rar.* iii. 95, and *Monogr. Lepidag.* 16, and in *DC. Prodr.* xi. 252; leaves petioled ovate or oblong minutely viscid-pubescent, spikes oblong very dense axillary and terminal often clustered ciliate often softly hairy, bracts lanceolate acuminate mucronate, calyx sub-5-partite, segments linear-lanceolate mucronate outer larger, corolla  $\frac{1}{4}$  in. *T. Anders. in Journ. Linn. Soc.* ix. 498. *L. incurva*, *Don Prodr.* 119. *Ruellia dependens*, *Roxb. Fl. Ind.* iii. 49; *Wall. Cat.* 2365.

Throughout N. INDIA, alt. 0–4000 ft., very common; from Jamu to Upper Assam and Chittagong. BEHAR and CHOTA NAGPORE, frequent. PEGU and TENASSERIM, common.—DISTRIB. Burma, S. China.

A perennial herb, 1–2 ft. *Leaves* 3 by  $1\frac{1}{2}$  in., uppermost often narrower, pendent, undulate; petiole  $\frac{1}{2}$  in. *Spikes*  $\frac{1}{2}$ – $1\frac{1}{2}$  in., erect, 1-sided; bracts nearly  $\frac{1}{2}$  in.; bracteoles  $\frac{1}{3}$  in., linear-lanceolate, mucronate. *Sepals*  $\frac{1}{3}$  in., ciliate, sometimes softly hairy. *Corolla* white with brown spots in the palate. *Capsule*  $\frac{1}{2}$  in., 4-seeded.—Of this plant so universal in N. India there is no plate extant; nor is there any example of the typical form at Kew collected in the Deccan. Roxburgh says his *Ruellia dependens* is native in Mysore; but the examples in his collections under that name are all the common Bengal form.

VAR. *mollis*; leaves all ovate hairy on both surfaces, heads very softly hairy.—Himalaya Terai, frequent.

VAR. *ustulata*; plant 1–5 in., leaves 1 in., spikes  $\frac{1}{2}$ –1 in. ovoid, bracts rather larger than in *L. hyalina* type. *L. ustulata*, *Nees in Wall. Pl. As. Rar.* iii. 95, and *Monogr. Lepidag.* 18, and in *DC. Prodr.* xi. 253. *Ruellia mucronata*, *Wall. Cat.* 2366, letters  $\gamma$ ,  $\epsilon$ .—Kashmir and N.W. Himalaya, alt. 2–4000 ft., *Thomson, Strachey & Winterbottom, &c.* A very local and easily separable form.

VAR. *mucronata*; leaves ovate pubescent beneath, spikes and heads small or large, bracts  $\frac{1}{4}$  in. *L. mucronata*, *Nees in Wall. Pl. As. Rar.* iii. 95, and *Monogr. Lepidag.* 11, and in *DC. Prodr.* xi. 250. *L. neurophylla*, *T. Anders. in Journ. Linn. Soc.* ix. 497. *Ruellia mucronata*, *Wall. Cat.* 2366, type sheet.—Concan, Canara, Nilgherries, &c., *Stocks, Wight, Dalzell, &c.*—Nees founded this species on Wight's plant (*Herb. Propr. n.* 1968), which has small leaves; subsequently he (in *DC. Prodr.*) added such specimens from Mergui as had small leaves: these, however, having bracts  $\frac{1}{3}$ – $\frac{1}{2}$  in. are nearer *L. purpuricaulis*, though their stems are not very purple. T. Anderson's *L. neurophylla* has full-sized leaves; the bracts are nearly the same as in Var. *mucronata*.

VAR. *lophostachyoides*, *Nees in DC. Prodr.* xi. 252; leaves large, spikes  $2\frac{1}{2}$  by  $\frac{1}{2}$  in. 1-sided, bracts as in *L. hyalina* type.—Ceylon; *Gardner, Walker, &c.* Bababoodun Hills; *Cleghorn*.—This variety in habit and in details runs very near *L. chlorostachya*, but has the spikes rather slenderer, the bracts rather smaller.

VAR. *semiherbacea*; leaves linear-lanceolate often shining. *L. semiherbacea*, *Nees in Wall. Pl. As. Rar.* iii. 96, and *Cat.* 7164, and *Monogr. Lepidag.* 20, and in *DC. Prodr.* xi. 253; *Wall. Cat.* 7164. *L. iridescens*, *T. Anders. in Journ. Linn. Soc.* ix. 496. *Lepidagathis* sp., *Griff. Notul.* iv. 137.—From Sikkim and Assam to Burma, very common in the Terai and adjacent Tropical Valleys.—Stems often elongate, diffuse, with long nodes; the lower stem leaves (in the extreme form of the variety) 7 by  $\frac{3}{4}$  in. But intermediate forms are more common, having the lower leaves ovate, the upper or uppermost oblong or linear, large or small. Some of the examples only differ from *L. simplex*, *T. Anders.*, in having numerous heads.

VAR. *riparia*; leaves large ovate, heads large softly ciliate, bracts  $\frac{1}{2}$  in. (or sometimes longer) acuminate long aristate. *L. riparia*, *Nees in DC. Prodr.* xi. 253. *L. aristata*, *Nees in Wall. Pl. As. Rar.* iii. 95, and *Monogr. Lepidag.* 19; *Wall. Cat.* 7163 (not *Ruellia aristata*, *Vahl*).—Rangoon; *McLelland*. Pegu Yomah; *Kurz*. Tenasserim; *Beddome*. Siamese Hills; *Parish*.—*Kurz* and *Beddome* have noted on their specimens that this is probably a distinct species; and it seems more distinct from *L. hyalina*, to which T. Anderson reduced it, than some usually admitted species.

21. **L. linearis**, *T. Anders. in Cat. Hort. Calc.* 43, and in *Journ.*



*Linn. Soc.* ix. 496; leaves subsessile linear acute at both ends scabrous pale beneath, spikes terminal or axillary tetragonal subsecund dense woolly, bracts herbaceous obliquely lanceolate mucronate ciliate 1-nerved, calyx 5-partite membranous ciliate upper segment lanceolate rounded at the tip 3-nerved.

BURMA; *R. Scott*.

Perennial; stems several, 2–3 ft., tetragonous, winged, glabrous. *Leaves* 3–6 in., scabrous. *Spikes* 1–2 in., hoary woolly. *Terminal spikes* 2–3 together, axillary solitary opposite; bracteoles membranous, concave, obovate, obtuse at both ends, ciliate. *Corolla* and *capsule* appear (ex descr.) same as of *L. hyalina* (*T. Anderson*).—Not seen.

\*\* *Leaves crenate or crenate-serrate*. (Anther-cells more separated and more divergent at the base than in the rest of the genus.)

22. ***L. ceylanica***, *Nees Monogr. Lepidag.* 35, and in *DC. Prodr.* xi. 259; leaves petioled ovate-lanceolate nearly glabrous, bracts as long as the calyx elliptic or obovate scarious 3-nerved glabrous ciliate. *T. Anders. in Journ. Linn. Soc.* ix. 498. *L. nervosa*, *Wight Ic.* t. 1620.

CEYLON; *Walker, Thwaites*.

*Stems* 2–3 ft., herbaceous, diffuse, 4-angular, glabrous. *Leaves* 3 by  $\frac{1}{4}$  in., acuminate at both ends, crenate-serrate, obscurely puberulous; petiole  $\frac{1}{2}$  in. *Spikes*  $\frac{3}{4}$  in., ovoid or obovoid, in dense panicles or clusters; bracts  $\frac{1}{2}$  by  $\frac{1}{4}$  in., mucronate; bracteoles  $\frac{1}{3}$  by  $\frac{1}{8}$  in., subfalcate, scarious, 3-nerved, ciliate. *Calyx*  $\frac{1}{3}$ – $\frac{1}{2}$  in., deeply 5-fid, scarious, glabrous, ciliate; outer segment oblong or elliptic, other 4 narrow. *Corolla*  $\frac{1}{2}$  in. *Capsule*  $\frac{1}{4}$  in., 4-seeded.

23. ***L. Walkeriana***, *Nees in DC. Prodr.* xi. 260; leaves petioled ovate-lanceolate nearly glabrous, bracts half as long as the calyx elliptic. *Wight Ic.* t. 1530; *T. Anders. in Journ. Linn. Soc.* ix. 499. *L. ceylanica*, Var.  $\beta$ , *Nees Monogr. Lepidag.* 35.

CEYLON; *Walker, Macrae, &c.*

*Bracts*  $\frac{1}{8}$  in., 3-nerved, subscarious. *Calyx*  $\frac{1}{4}$  in., densely minutely glandular-hairy or glabrate ciliate. Otherwise as *L. ceylanica*, which it so greatly resembles that *Wight* has noted on the specimen he has figured a doubt whether it was the “true *Walkeriana*,” which it certainly is.

24. ***L. fasciculata***, *Nees in Wall. Pl. As. Rar.* iii. 95, and *Monogr. Lepidag.* 10, and in *DC. Prodr.* xi. 260; leaves petioled ovate or ovate-lanceolate pubescent, bracts herbaceous as long as the calyx ovate or elliptic 3-nerved hairy. *T. Anders. in Journ. Linn. Soc.* ix. 498; *Bedd. Ic. Pl. Ind. Or.* t. 228; *Wawra Bot. It. Pr. S. Cob.* i. 88, t. 13. *L. hirta*, *Nees Monogr. Lepidag.* 37. *L. goensis*, *Dalz. in Hook. Kew Journ.* ii. 340; *Dalz. & Gibs. Bomb. Fl.* 191. *Ruellia fasciculata*, *Retz. Obs.* iv. 28; *Roxb. Fl. Ind.* iii. 48; *Wall. Cat.* 2406, and 2394 partly.

Throughout TROPICAL and SUBTROPICAL INDIA, from the base of the N.W. HIMALAYA and BENGAL to CEYLON and TENASSERIM; mostly rare, plentiful in Malabar.

*Stems* 1 foot, herbaceous, diffuse, hairy. *Leaves* 2 by 1 in., crenate-serrate, pubescent at least on the nerves beneath; petiole  $\frac{1}{4}$  in. *Spikes*  $\frac{1}{3}$  in. diam., or often elongate, interrupted below with the lower flowers in opposite pairs; bracts  $\frac{1}{8}$ – $\frac{1}{4}$  in., in fruit somewhat enlarged; bracteoles rather shorter than the bracts, falcate-oblong. *Corolla* and *capsule* nearly as of *L. hyalina*.—This plant always occurs mixed with *Hemigraphis latebrosa*, *Nees*; without counting the ovules or seeds it may be distinguished therefrom by the presence of bracteoles, the capi-



tellate sub-bifid stigma, the corolla suddenly ventricose in the middle not tubular (as in *Hemigraphis latebrosa*).

VAR. *major*; leaves larger toothed or subentire, heads larger, bracts  $\frac{1}{2}$  by  $\frac{1}{4}$  in. acute subspinulose, calyx  $\frac{1}{3}$  in., corolla  $\frac{1}{2}$  in.—Tenasserim; Mooleyit, *Beddome*.—Much finer than the ordinary *L. fasciculata*, of which some examples from moist valleys in Malabar (marked *L. goensis*) come so near this Tenasserim plant that it is difficult to treat the latter as a species.

DOUBTFUL SPECIES.

*L. LONGIFOLIA*, *Wight Ic.* t. 1564; leaves large lanceolate glabrous, spikes elongate lax terminal subpanicked, bracts large elliptic acute, flowers large, anthers minutely spurred at the base. *T. Anders. in Journ. Linn. Soc.* ix. 499.

MALACCA; *Griffith* (Kew Distrib. n. 6138), *Maingay*.

*Branches* terete, glabrescent. *Leaves* 9 by 2 in., acute at both ends, entire; petiole  $\frac{2}{3}$  in. *Spikes* 3–7 by 1 in., clustered towards the end of the branch, lax, nodding, pubescent; bracts  $\frac{3}{4}$  by  $\frac{1}{4}$  in., opposite, one of each pair usually barren; bracteoles  $\frac{1}{2}$  in., oblong. *Calyx* nearly  $\frac{1}{2}$  in., 5-lobed nearly to the base; 3 segments broadly lanceolate, 2 linear. *Corolla* in form nearly as of *Lepidagathis* but larger, minutely hairy without, nearly glabrous; no traces of dots on the lower lip. *Stamens* 4, slightly didynamous; filaments glabrous, connective papillose; anthers oblong, cells parallel approximate each with a divaricate minute mucro at the base. *Ovary* depressed, glabrous, 4-ovulate; style patently hairy; stigma capitellate (not as in *Wight Ic.*). *Capsule* not seen.—A remarkable plant, both in habit and characters removed from *Lepidagathis*; in the absence of fruit it is advisable not to found a new genus on it. Nees marked it “Species ab Acanthaceis aliena.” In many points it approaches *Asystasia Lawiana* and *Strobilanthes*.

*L. STROBILINA*, *T. Anders. ms.*; *Kurz in Journ. As. Soc.* 1873, pt. ii. 96; glabrous, leaves lanceolate membranous entire, heads lax terminal largeish, corolla 1 in. funnel-shaped purple-lilac tube short.

MARTABAN; *Parish* (fide *Kurz*).

A herb, 1–2 ft., stems terete with 4 elevated lines. *Leaves* 7–8 in., acuminate at both ends, shining, petioled. *Bracts* 1 in., oblong-lanceolate acuminate thin-papery, tinged purple-lilac, 1-nerved and reticulated, glandulose-puberulous; bracteoles similar to the bracts but narrower. *Calyx* large. *Capsule* wanting.—Not seen; the foregoing translated from *Kurz l. c.* Appears ex descr. to be allied to *L. longifolia*.

XXXV. **PHIALACANTHUS**, *Benth.*

An erect, glabrous shrub. *Leaves* large, entire. *Cyme* terminal, loosely corymbose; pedicels slender; bracts minute. *Calyx* membranous, coloured, tubular-campanulate, shortly 5-toothed. *Corolla-tube* elongate, ventricose upwards; limb 2-lipped; lobes 5, subequal, imbricate in bud. *Stamens* 4; anthers all 2-celled; cells oblong, parallel, muticous. *Style* filiform; stigma minutely 2-lobed; ovules 2 in each cell. *Capsule* shortly stalked, oblong, 4-seeded. *Seeds* (unripe) compressed, orbicular in outline, retinacula stout.

**P. Griffithii**, *Benth. in Gen. Pl.* ii. 1102.

MISHMEE; *Griffith*.

*Leaves*  $7\frac{1}{2}$  by  $2\frac{1}{2}$  in., broad-elliptic, acuminate at both ends, bearing raphides on both surfaces; petiole  $1\frac{1}{2}$  in. *Cymes* 3 in. diam., short-peduncled; lower bracts  $\frac{1}{4}$  in., linear, upper minute; pedicels  $\frac{1}{4}$  in. *Calyx*  $\frac{1}{4}$  by  $\frac{1}{8}$  in., enlarged in fruit; teeth  $\frac{1}{16}$  in., triangular. *Corolla*  $1\frac{3}{4}$  in., orange with yellow mouth (*Griffith*). *Stamens* glabrous; anthers minutely pubescent. *Style* glabrous. *Disc* small, cup-shaped. *Capsule* (unripe)  $\frac{1}{4}$  in., glabrous.

XXXVI. **MONOTHECIUM**, *Hochst.*

Diffuse herbs. *Leaves* entire. *Spikes* small, ovate or oblong, dense;



bracts and bracteoles linear or setaceous. *Sepals* 5, equal, linear-setaceous. *Corolla* small, tubular, limb deeply 2-lipped. *Stamens* 2; anthers narrowly oblong, 1-celled, muticous, attached by the middle of the back. *Style* minutely bifid. *Capsule* oblong, on a short solid stalk, 4-seeded. *Seeds* compressed, orbicular, rugose subtubercled; retinacula stout.—Species 2, Indian and Tropical African.

**M. aristatum**, *T. Anders. in Thwaites Enum.* 234; leaves ovate or ovate-lanceolate pubescent on the nerves beneath, bracts  $\frac{1}{4}$ – $\frac{1}{3}$  in. linear setaceous lineolate. *Bedd. Ic. Pl. Ind. Or.* t. 269. *Justicia aristata*, *Wall. Cat.* 2481; *Nees in Wall. Pl. As. Rar.* iii. 115. *Anthocometes aristatus*, *Nees in DC. Prodr.* xi. 312.

CEYLON; *Walker, Wight, &c.* NILGHERY MTS.; *G. Thomson*.

*Stems* 1 foot, procumbent, much branched, often rooting. *Leaves*  $1\frac{1}{2}$  by  $\frac{2}{3}$  in., cuneate at both ends; petiole  $\frac{1}{3}$  in. *Spikes*  $\frac{1}{2}$ – $1\frac{1}{2}$  in., peduncled or sessile, pubescent or nearly glabrous; bracteoles 0 (barren bracts frequent). *Sepals*  $\frac{1}{4}$  in. *Corolla*  $\frac{1}{3}$  in., white, lower lip brown-spotted. *Capsule*  $\frac{1}{4}$  in.—This is so like *Justicia procumbens* that an example of it in *Herb. Kew* is marked "*Rostellularia procumbens*, Var.  $\alpha$  or  $\beta$ ," by *Nees'* hand.

### XXXVII. **CLINACANTHUS**, *Nees*.

A tall herb, minutely pubescent. *Leaves* ovate-lanceolate, entire or toothed. *Flowers* conspicuous, dull red, in small drooping cymes at the tips of the branches; bracts and bracteoles small, linear. *Sepals* 5, equal, linear-subulate. *Corolla-tube* elongate, curved at the base, widened upwards; limb 2-lipped. *Stamens* 2; anthers scarcely exerted, 1-celled, narrowly oblong, muticous, attached by the middle of the back. *Style* minutely bifid. *Capsule* oblong, on a short solid stalk, 4-seeded. *Seeds* muricate (*Nees*).

Only differs from *Hypoestes* by the small bracts.

**C. Burmanni**, *Nees in DC. Prodr.* xi. 511. *Justicia nutans*, *Burm. Fl. Ind.* 10, t. 5, fig. 1. *J. fulgida*, *Blume Bijl.* 784. *Beleropone?* *fulgida*, *Hassk. Cat. Hort. Bogor.* 151.

MALACCA; *Maingay*.—DISTRIB. Java, Borneo, Hainan.

*Leaves*  $2\frac{1}{2}$  by 1 in., acuminate, base cuneate or rounded; petiole  $\frac{1}{4}$  in., puberulous. *Cymes* about 5-fld.; bracts  $\frac{1}{8}$  in., linear; pedicels  $\frac{1}{16}$  in. *Sepals*  $\frac{1}{4}$  in., rusty pubescent. *Corolla*  $1\frac{1}{4}$  in., lobed  $\frac{1}{3}$ – $\frac{1}{2}$  in. *Stamens* and *pistil* glabrous.

### XXXVIII. **JUSTICIA**, *Linn.*

Herbs or shrubs. *Leaves* entire. *Flowers* sessile or nearly so, spiked or paniced (rarely solitary), small or middle-sized; bracts large or small; bracteoles narrow or 0. *Calyx* 5- or 4-partite; segments narrow. *Corolla-tube* shorter, or scarcely longer, than the 2-lipped limb; upper lip 2-lobed or subentire, lower 3-lobed, lobes imbricate in bud. *Stamens* 2, filaments often dilated, hairy near the base; anthers 2-celled; cells oblong or round, usually more or less separate, lower always with a white basal appendage. *Ovary* 4-ovulate; style filiform, shortly bifid. *Capsule* ovoid or ellipsoid, 4-seeded from the base, or with a long solid cylindric stalk 4-seeded at the apex. *Seeds* ovoid, more or less compressed, tubercular, scaly or glochidiate-subspinescent (appearing hispid), never with fine elastic hairs springing out when wetted.—Species 100, in the warm regions of both hemispheres.



*Justicia bivalvis*, Roxb. Fl. Ind. i. 124, came from the Moluccas, and was probably a *Dicliptera*; though Roxburgh quotes his species as the same as Linnæus' under that name, he excludes (correctly) the plate on which Linnæus founded his species.

*Gendarussa virgata*, Wall. Cat. 7176, was collected in Ava, outside the bounds of British India.

*Justicia inconspicua*, Wall. Cat. 2475, collected in Penang, is not in Wallich's Herbarium at the Linn. Soc., nor are there any data for determining its genus.

Sect. 1. **Hemichoriste.** Shrubby. *Spikes* elongate; flowers clustered; bracts herbaceous, subovate. *Corolla* and *capsule* large.

1. **J. montana**, Wall. Cat. 2471, not of Roxb.; leaves large elliptic acute at both ends glabrous, spikes near the ends of the branches subpaniculate, inflorescence subviscidly pubescent. *T. Anders. in Journ. Linn. Soc.* ix. 509; *Benth. in Gen. Pl.* ii. 1109. *J. longifolia*, Wall. Cat. 2437. *Hemichoriste montana*, Nees in Wall. Pl. As. Rar. iii. 102, and in DC. Prodr. xi. 367; *Dalz. & Gibs. Bomb. Fl.* 194; *Wight Ic.* t. 1538.

W. DECCAN PENINSULA, in the Ghauts, from Mahabelaishwur (*Law*) to Nilgherries (*Wight*).

*Stem* erect, subtetragonous, puberulous upwards. *Leaves* 9 by  $3\frac{1}{2}$  in., both surfaces punctulate; petiole 1 in. *Spikes* 6–15 in., the terminal often paniculately branched; lower clusters of flowers usually distant, upper continuous; bracts  $\frac{1}{4}$  by  $\frac{1}{8}$  in., lower larger; bracteoles smaller, elliptic, near the base of the pedicel; pedicels  $0-\frac{1}{8}$  in. *Sepals* 5,  $\frac{1}{4}$  in., sublinear, pubescent. *Corolla* 1– $1\frac{1}{4}$  in., 2-lipped half its length, minutely pubescent, red. *Stamens* 2 (without any rudiments); lower anther-cells long-spurred. *Capsule* 1 in., clavate, pubescent, 4-seeded near the top. *Seeds* glabrous, intensely rugose, but possibly smooth when fully ripe.—Nees says “stamens 4, 2 shorter with 1-celled anthers or rudimentary;” but there is no trace of these shorter stamens in the example named by Nees' hand.

Sect. 2. **Betonica.** Shrubs or herbs. *Spikes* continuous; bracts ovate or elliptic, often 4-ranked, mostly imbricate. *Calyx-segments* 5, nearly equal.

\* *Bracts* white, green-nerved.

2. **J. Betonica**, Linn.; Roxb. Fl. Ind. i. 128; tall shrubby puberulous, leaves ovate-lanceolate, bracteoles large ovate-lanceolate, corolla  $\frac{1}{2}$  in. white rose-spotted. *Burm. Fl. Ind.* 8; Wall. Cat. 2433; *T. Anders. in Journ. Linn. Soc.* ix. 510; *Kurz For. Fl.* ii. 247. *J. ochroleuca*, *Blume Bijl.* 786. *Adhatoda Betonica*, Nees in Wall. Pl. As. Rar. iii. 103, and in DC. Prodr. xi. 385.—*Rheede Hort. Mal.* ii. t. 21.

Throughout INDIA and CEYLON, common; often cultivated.—DISTRIB. Malaya, Tropical Africa.

*Branches* terete, glabrous, tips pubescent. *Leaves* 3 by  $1\frac{3}{4}$  in. (lower sometimes much larger), punctulate on both surfaces, not lineolate, base shortly attenuate; petiole  $\frac{1}{3}$  in. *Spikes* 1–4 by  $\frac{3}{4}$  in., short-peduncled, terminal, often on short lateral branches appearing lateral; bracts  $\frac{2}{3}$  by  $\frac{1}{3}$  in., ovate acute, white, minutely pubescent; bracteoles  $\frac{1}{3}-\frac{1}{2}$  in., similar to the bracts. *Sepals*  $\frac{1}{6}$  in., linear-lanceolate, pubescent. *Capsule*  $\frac{2}{3}$  in., stoutly clavate, pubescent, 4-seeded. *Seeds* ovoid, somewhat compressed, glabrous, densely rugose in nearly all herbarium specimens, but smooth in some fully ripened.

VAR. *villosa*; stem softly hairy, leaves hairy beneath, flowers salmon-coloured. *J. Pseudo-Betonica*, *Roth Nov. Sp.* 17.—Central India and Chota Nagpore, alt. 1–5000 ft, common.

VAR. *ramosissima*; stems decumbent diffuse, bracts rather narrower. *J. ramosissima*, Roxb. Fl. Ind. i. 129; *T. Anders. in Journ. Linn. Soc.* ix. 510. *Adhatoda*



ramosissima, *Nees in Wall. Pl. As. Rar.* iii. 103, and in *DC. Prodr.* xi. 385; *Dalz. & Gibs. Bomb. Fl.* 193.—Throughout India, frequent.—This plant is said to have both axillary and terminal spikes, while *J. Betonica* is said to have only terminal; but there is no difference in the inflorescence between them.

3. ***J. nilgherrensis***, *Wall. Cat.* 2435; small procumbent nearly glabrous, leaves sessile oblong obtuse, spikes dense, bracteoles  $\frac{1}{3}$ – $\frac{1}{2}$  by  $\frac{1}{4}$  in., corolla  $\frac{1}{2}$ – $\frac{2}{3}$  in. pale. *J. neilgherriensis*, *T. Anders. in Journ. Linn. Soc.* vii. 118. *Adhatoda nilgherrensis*, *Nees in Wall. Pl. As. Rar.* iii. 103. *A. nilgherrica*, *Nees in DC. Prodr.* xi. 386; *Wight Ic.* t. 1544.

NILGHERRIES, alt. 7–8000 ft.; plentiful in the grass round Ooty.

*Rootstock* woody. *Stems* 2–8 in., numerous. *Leaves*  $1\frac{1}{3}$  by  $\frac{1}{3}$  in. *Spikes* terminal,  $\frac{1}{2}$ –2 in.; bracts  $\frac{2}{3}$  by  $\frac{1}{3}$  in., scarious-margined, very acute. *Capsule*  $\frac{2}{3}$  in., stout, clavate, pubescent, 4-seeded. *Seeds* (not ripe) glabrous, subtubercular, rugose, not differing from those of some examples of *J. Betonica* at the same stage.—Seems distinct, but not allowed by T. Anderson (in *Thwaites Enum.* 233). Though the plant is so humble, the bracts, corolla and capsule are full as large as in *J. Betonica*.

4. ***J. trinervia***, *Vahl Enum.* i. 156; small, procumbent, nearly glabrous, leaves ovate or elliptic, spikes lax continuous, bracteoles  $\frac{1}{3}$  in. lanceolate, corolla  $\frac{1}{3}$  in. *Wall. Cat.* 2446. *J. Betonica*, *T. Anders. in Journ. Linn. Soc.* ix. 509, partly. *Adhatoda trinervia*, *Nees in Wall. Pl. As. Rar.* iii. 103, and in *DC. Prodr.* xi. 386; *Dalz. & Gibs. Bomb. Fl.* 194.

W. DECCAN PENINSULA, in the Ghauts, frequent; Concan, *Stocks*, *Dalzell*; Canara, *Ritchie*; Nilgherries, *Wight*, &c.

*Rootstock* woody; stems 3–8 in. *Leaves*  $\frac{1}{4}$ –1 in., lower mostly short-petioled, upper sessile. *Spikes* 1–4 by  $\frac{1}{2}$  in.; bracts  $\frac{1}{3}$  by  $\frac{1}{3}$  in., lanceolate, white or sometimes green, not or obscurely nervose.—This plant, “a small var. of *J. Betonica*” (T. Anders. ms.), differs considerably in the slender spikes and narrow bracts, as well as in size and habit, nor are there intermediates in the Herbarium.

VAR. *arenaria*; leaves linear-oblong, spikes often small. *Adhatoda arenaria*, *Nees in DC. Prodr.* xi. 387.—W. India; Concan, Belgaum, &c.

\*\* *Bracts green, often purple-tinged, not white though sometimes scarious-margined.*

5. ***J. ventricosa***, *Wall. Pl. As. Rar.* i. 80, t. 93, and *Cat.* 2436, and 7174 in part; leaves elliptic cuneate at both ends glabrous minutely lineolate, bracts orbicular imbricated usually 3-fld., bracteoles minute, corolla  $\frac{2}{3}$  in. white rose-spotted. *Bot. Mag.* t. 2766; *T. Anders. in Journ. Linn. Soc.* ix. 509; *Kurz For. Fl.* ii. 248. *Adhatoda ventricosa*, *Nees in DC. Prodr.* xi. 407. *Gendarussa ventricosa*, *Nees in Wall. Pl. As. Rar.* iii. 104.

PEGU and TENASSERIM; *Wallich*, *M'Lelland*, &c.—DISTRIB. Siam, China (cultivated?).

*Branches* stout, glabrous. *Leaves* 6 by  $2\frac{1}{2}$  in.; petiole  $\frac{1}{4}$  in. *Spikes* 3 by  $\frac{3}{4}$  in., continuous, somewhat dense; peduncles 0–1 in., terminal, or terminal on short lateral branches; bracts  $\frac{1}{3}$ – $\frac{1}{2}$  in. diam., sub-4-ranked, puberulous. *Flowers* usually 3 in the axil of each bract subsessile; bracteoles  $\frac{1}{8}$  in., subulate, or 0. *Calyx*  $\frac{1}{8}$ – $\frac{1}{6}$  in.; segments sublinear. *Capsule*  $\frac{1}{3}$  in., hairy.

6. ***J. oreophila***, *Clarke*; leaves broadly elliptic acute at both ends pubescent beneath, bracts orbicular imbricate 1-fld., bracteoles large spathulate-oblong.

CHITTAGONG Seetakoond alt. 1000 ft., *J. D. H.*



A shrub, habit of *J. ventricosa*; innovations densely silky strigose. *Leaves*  $8\frac{1}{2}$  by  $3\frac{1}{2}$  in., above minutely thinly hairy, nerves reticulate impressed, beneath pubescent especially on the nerves; petiole  $\frac{3}{4}$  in. *Peduncles* 1–3 in., axillary; spikes 4 by 1 in., rachis softly hairy; bracts sub-4-ranked,  $\frac{1}{2}$  by  $\frac{1}{3}$  in., green, puberulous, 5-nerved; bracteoles  $\frac{1}{2}$  by  $\frac{1}{8}$  in., green. *Calyx*  $\frac{1}{6}$  in., pubescent; segments linear-lanceolate.—Differs from *J. ventricosa* in the indumentum and bracteoles.

7. ***J. punduana***, *Wall. Cat.* 2453; leaves broadly elliptic acute at both ends minutely lineolate nerves beneath villous, bracts ovate scarious-margined 1-fld., bracteoles oblong acute scarious longer than the calyx, corolla  $\frac{1}{3}$  in. *Rungia punduana*, *Nees in Wall. Pl. As. Rar.* iii. 110, and in *DC. Prodr.* xi. 473; *T. Anders. in Journ. Linn. Soc.* ix. 518.

E. BENGAL; Jaintea Mts., *Gomez*; Cachar, *Keenan*.

A shrub; stem rooting; annual branches 1 foot, villous-pubescent. *Leaves* 6 by 2– $2\frac{3}{4}$  in.; petiole  $\frac{1}{4}$  in. *Spikes* axillary and terminal,  $1\frac{1}{2}$  by  $\frac{1}{2}$  in., dense; peduncles  $\frac{1}{4}$  in.; bracts closely imbricate, imperfectly 4-ranked,  $\frac{1}{2}$  by  $\frac{1}{3}$  in., obtuse or subacute; bracteoles  $\frac{1}{4}$  in., minutely hairy. *Sepals*  $\frac{1}{3}$  in., equal, linear-lanceolate, minutely hairy. *Anther-cells* minutely hairy, lower distinctly white-tailed. *Capsule* scarcely  $\frac{1}{3}$  in., pubescent, clavate, 4-seeded; pedicel solid, placentæ not rising elastically from the capsule-base. *Seeds* glabrous, rugose, subtubercular.—Very few of the plants marked *Pundua* by Wallich were collected at or near *Pundua*; the present species was collected by Gomez (Wallich's trained Eurasian collector), and delivered to Wallich in his boat at *Pundua*. It is strange that Nees and T. Anderson should have removed this species to *Rungia*; for it is a shrub resembling *J. Atkinsoni*, &c.

8. ***J. burmanica***, *Clarke*; leaves long-petioled broadly elliptic acute at both ends villous on the nerves beneath, bracts obovate or orbicular nearly glabrous 1-fld., bracteoles broadly lanceolate longer than the calyx.

BURMA; *Griffith* (*Kew Distrib.* ii. 6184).

Resembling very much *J. Keenani*, but the leaves are long-petioled, the bracts herbaceous, uniformly intensely green (even when dried) without a scarious margin. *Spikes* 2–5 in., continuous but lax; bracts sometimes scarcely imbricate, subpatent. *Corolla* not seen. *Capsule*  $\frac{1}{2}$  in., 4-seeded, glabrous or puberulous.

9. ***J. argyrostachya***, *T. Anders. in Journ. Linn. Soc.* ix. 510; leaves large ovate minutely pubescent, bracts ovate patently softly long-hairy 1-fld., bracteoles falcate-oblong longer than the calyx, corolla  $\frac{1}{2}$  in. *Adhatoda argyrostachya*, *Nees in Wall. Pl. As. Rar.* iii. 1027, and *Cat.* 7172, and in *DC. Prodr.* xi. 385.

BURMA; Prome Hills, *Wallich*.

An undershrub (or large herb) with the habit of the preceding species. *Leaves* 11 by 5 in., shortly attenuate at both ends; petiole  $1\frac{1}{2}$  in. *Spikes* axillary, solitary and terminal, 2–5 by 1 in., continuous; peduncles short; bracts  $\frac{1}{2}$ – $\frac{2}{3}$  by  $\frac{1}{3}$  in., imbricate, green purple-margined; bracteoles  $\frac{1}{4}$ – $\frac{1}{3}$  in. *Sepals* 5,  $\frac{1}{4}$  in., linear-lanceolate. *Corolla* (fide Nees) yellowish-white purple-marked. *Capsule*  $\frac{1}{3}$  in., clavate, 4-seeded.—This differs from the allied species (except *J. Kurzii*) by the long soft hairs on the bracts.

10. ***J. Kurzii***, *Clarke*; leaves large ovate minutely pubescent, bracts large elliptic acute softly long-hairy 1-fld., bracteoles sublinear longer than the calyx, corolla nearly 1 in.

PEGU; *Kurz*.

A large herb, closely resembling *J. argyrostachya* except as to the corolla. *Leaves* 7 by  $4\frac{1}{2}$  in., acute, base suddenly attenuate; petiole  $2\frac{1}{2}$  in. *Spikes* 3–4 in.; bracts  $\frac{3}{4}$  by  $\frac{1}{4}$  in., sub-4-ranked; bracteoles  $\frac{1}{3}$ – $\frac{1}{2}$  in., hairy. *Calyx-segments*  $\frac{1}{4}$ – $\frac{1}{3}$  in., linear-



setaceous hairy. *Corolla* (dried) rose-purple, spotted; tube much inflated upwards. Lower *anther-cell* conspicuously white-tailed. — A specimen, issued by Kurz under the same number (2167), has large oblong leaves much attenuate at both ends; petiole winged to the base, and there often auriculate; capsules  $\frac{1}{2}$  in.; clavate, 4-seeded. From the variations of the leaves in some allied species, it is probably a form of *J. Kurzii*.

11. **J. Atkinsoni**, *T. Anders. in Journ. Linn. Soc.* ix. 509; leaves long-petioled ovate caudate-acuminate puberulous on the nerves beneath, bracts suborbicular pubescent 1-fld., bracteoles linear nearly as long as the bracts, corolla  $\frac{1}{2}$  in.

SIKKIM and E. BHOTAN, alt. 2–6000 ft., from the outer hills to the northern valleys frequent, *T. Anderson, &c.*

A shrub, 2–3 ft. *Leaves* 8 by  $4\frac{1}{2}$  in. (many smaller narrower), base shortly decurrent; petiole 3 in. *Spikes* terminal, solitary, 2–5 by  $\frac{3}{4}$  in., continuous; peduncles  $\frac{1}{2}$ –2 in.; bracts  $\frac{1}{3}$ – $\frac{1}{2}$  in., green, purple-margined; bracteoles  $\frac{1}{3}$  in., green. *Sepals* 5,  $\frac{1}{4}$ – $\frac{1}{3}$  in., linear, puberulous. *Corolla* hairy without, yellowish-white rose-marked. *Stamens* and *pistil* glabrous; lower anther-cell distinctly white-tailed. *Capsule*  $\frac{1}{3}$  in., clavate, 4-seeded. *Seeds* glabrous, rugose, subtubercular.

12. **J. grandifolia**, *T. Anders. in Journ. Linn. Soc.* ix. 510; leaves long-petioled large round-ovate nearly glabrous, bracts elliptic acute rusty pubescent 1-fld., bracteoles  $\frac{1}{2}$  in. linear-lanceolate hairy, corolla  $\frac{3}{4}$ –1 in.

MOULMEIN; *Parish*. TENASSERIM; *Beddome*.

A herb (*T. Anders.*). *Leaves* 8–5 in., attaining 14 by 7 in. (*T. Anders.*), shortly acuminate, base rounded or very shortly decurrent; petiole  $3\frac{1}{2}$  in. *Spikes* axillary and terminal, 3–11 by 1 in., continuous, somewhat lax, very pubescent; peduncles 0–1 in.; bracts  $\frac{3}{4}$ –1 by  $\frac{1}{3}$  in. *Sepals* 5,  $\frac{1}{3}$  in., linear-lanceolate, very pubescent. *Corolla*  $\frac{3}{4}$ –1 in., pubescent, white purple-marked. *Anther-cells* glabrous, subparallel, lower minutely white-tailed. *Capsule*  $\frac{1}{2}$  in., stoutly clavate, pubescent, 4-seeded.

13. **J. dasycarpa**, *Kurz in Journ. As. Soc.* 1873, pt. ii. 96; leaves ovate acute subglabrous, bracts ovate softly hairy, bracteoles oblong longer than the calyx, corolla  $\frac{1}{3}$  in. *Neuracanthus tetragonostachyus*, *Wall. Cat.* 7168, *by admixture*.

TENASSERIM; Chappedong, *Wallich*. RANGOON; *M'Lelland*. KAREN HILLS, *Kurz*.

*Stem*  $1\frac{1}{2}$ –3 ft., glabrous, pubescent upwards. *Leaves* 3 by 2 in., base obtuse, raphides conspicuous on both surfaces; petiole  $\frac{1}{2}$  in., pubescent. *Spikes* axillary and terminal,  $\frac{1}{2}$ – $1\frac{1}{2}$  by  $\frac{1}{3}$  in., continuous; peduncles  $\frac{1}{8}$  in.; bracts  $\frac{1}{4}$  in., green; bracteoles  $\frac{1}{6}$  in. *Calyx*  $\frac{1}{8}$  in.; segments 5, linear-lanceolate, pubescent. Lower *anther-cell* shortly white-tailed. *Capsule*  $\frac{1}{3}$  in., clavate, pubescent, 4-seeded.—The bracts are 1–3-fld.; where several flowers occur, some of the bracteoles are suppressed. The leaves, bracts and flowers are considerably smaller than in the preceding species.

14. **J. fragilis**, *Wall. Cat.* 7174, *type sheet only*; leaves oblong narrowed at both ends glabrous, bracts elliptic acute puberulous several-fld., bracteoles small linear or 0, corolla  $\frac{2}{3}$  in.—*Justicia* sp., *Griff. Notul.* iv. 143.

TENASSERIM; Amherst, *Wallich*; Mergui, *Griffith*.

*Branch* elongate, glabrous. *Leaf* 5 by  $1\frac{1}{4}$  in.; petiole  $\frac{1}{3}$  in. *Spikes* 1–5 in., terminal and quasi-axillary on short-lateral branches, interrupted below; bracts  $\frac{1}{3}$  by  $\frac{1}{6}$  in., uniformly green, somewhat deciduous, upper imbricate; flowers clustered on the spikes; bracteoles 0– $\frac{1}{8}$  in. *Sepals* 5,  $\frac{1}{8}$ – $\frac{1}{6}$  in., linear, puberulous. *Corolla* pubescent, altogether as of Sect. *Betonica*. *Stamens* and *pistil* very nearly glabrous; lower anther-cell distinctly shortly white-tailed.—The elongate spikes interrupted below



and deciduous bracts are very unlike *J. ventricosa*, with which Nees united this, and which has been distributed by Wallich under the same number.

15. ***J. caloneura***, *Kurz in Journ. As. Soc.* 1873, pt. ii. 96; leaves elliptic acute at both ends minutely pubescent, bracts ovate acuminate pubescent, bracteoles broadly lanceolate exceeding the calyx, corolla  $\frac{1}{3}$ – $\frac{1}{2}$  in.

TENASSERIM; *Beddome*.

A perennial herb; stems 2–3 ft., glabrous or crisped-pubescent. *Leaves* 4 by  $1\frac{1}{2}$  in., nerves conspicuously reticulate on both surfaces; petiole 0– $\frac{1}{2}$  in., crisped-pubescent. *Spikes* terminal,  $1\frac{1}{2}$  by  $\frac{1}{2}$  in., dense; peduncles  $\frac{1}{4}$  in.; bracts  $\frac{1}{4}$  by  $\frac{1}{6}$  in., 4-ranked, striate, green black-tipped, ciliate; bracteoles  $\frac{1}{2}$  by  $\frac{1}{8}$  in., green. *Sepals* 5,  $\frac{1}{6}$  in., linear, pubescent. *Corolla* minutely hairy, straw-coloured (Kurz). *Anther-cell* distinctly white-tailed. *Capsule* not seen.—Identified with Kurz's *J. caloneura* from description only.

16. ***J. ceylanica***, *T. Anders. in Thwaites Enum.* 233, and in *Journ. Linn. Soc.* ix. 513; leaves lanceolate or ovate-lanceolate glabrous, bracts and bracteoles spatulate orbicular, corolla  $\frac{1}{2}$  in. *Adhatoda ceylanica*, *Nees in DC. Prodr.* xi. 400.

CEYLON; *Walker, Gardner, &c.*

Herbaceous, 2–3 ft., branched, glabrous; whole plant, including the bracts, drying black. *Leaves* 3 by 1 in., acuminate, not or very obscurely lineolate, base cuneate, midrib beneath glabrous; petiole  $\frac{1}{8}$  in. *Spikes* axillary, branched, lax, nearly glabrous; bracts  $\frac{1}{8}$  in., orbicular, on a  $\frac{1}{8}$  in. pedicel, patent; bracteoles similar, but rather smaller; flowers in distant opposite pairs. *Calyx-segments* 5,  $\frac{1}{8}$  in., linear, nearly glabrous. *Corolla* nearly glabrous, purple (fide Nees); lower lip longer. *Capsule*  $\frac{1}{2}$  in., clavate, puberulous, 4-seeded.

*VAR. viridescens*; leaves larger pubescent on the nerves beneath, bracts larger obovate, bracteoles oblong.—Ceylon; *Walker, Thwaites*, C. P. n. 2422, partly.—Whole plant drying green. *Leaves* 5 by 2 in., conspicuously lineolate on both surfaces. *Spikes* 2–4 in., much interrupted; bracts  $\frac{1}{2}$  by  $\frac{1}{4}$  in., green, nearly glabrous; bracteoles  $\frac{1}{4}$  in. *Calyx-segments*  $\frac{1}{4}$ – $\frac{1}{2}$  in., green, lineolate. *Capsule* as of type.—Very unlike *J. ceylanica*, of which both Nees and T. Anderson consider it a form.

*VAR. capitata*, *T. Anders. ms.*; leaves pubescent, spikes capitate globose solitary on short axillary peduncles.—Ceylon; *Thwaites*, n. 3919, and 2422 partly.—*Branches* pubescent. *Leaves* subhispidly pubescent on both surfaces, drying green. *Peduncles*  $\frac{1}{4}$  in.; heads  $\frac{2}{3}$  in. diam., rusty pubescent; bracts densely imbricate. *Calyx-segments*  $\frac{1}{2}$  in., oblong-lanceolate, subscarious. *Corolla* and *stamens* as of *J. ceylanica*. *Capsule* not seen.—A very puzzling plant, not seen by Nees; Mr. Bentham observes that it is “very near Sect. *Anisostachya*.”

17. ***J. glauca***, *Rottler; Roem. & Sch. Syst.* i. 165; herbaceous, leaves 1–2 in. ovate puberulous or pubescent, bracts ovate or orbicular puberulous ciliate or pubescent, corolla  $\frac{1}{2}$  in. *J. brachioides*, *Roth Nov. Sp.* 16. *J. orixensis*, *Roxb. Fl. Ind.* i. 132; *T. Anders. in Journ. Linn. Soc.* ix. 510, partly. *J. tranquebariensis*, *Roxb. l. c.* 130; *Wall. Cat.* 2424 (not 2462); *T. Anders. l. c.* 513, partly; not of *Linn. f.* *J. brachionoides*, *Spreng. Syst.* i. 82. *Gendarussa orixensis*, *Nees in Wall. Pl. As. Rar.* iii. 104. *Adhatoda orixensis & diversiformis*, *Nees in DC. Prodr.* xi. 400, 399.

DECCAN PENINSULA, alt. 0–2000 ft., frequent; *Rottler, &c.*

*Stems* 8–20 in., herbaceous, puberulous, diffuse; internodes long. *Leaves* pubescent on the nerves beneath, those at the main nodes acute at both ends, many smaller often rounded leaves on the lateral branches; petiole  $\frac{1}{2}$  in. *Spikes* 1–5 by  $\frac{1}{2}$  in., terminal, lax; solitary bractless flowers often scattered in the distant lower axils; bracts  $\frac{1}{4}$  in. diam., often subpatent, very variable in indumentum; bracteoles  $\frac{1}{8}$  in., obovate-oblong, or often 0. *Sepals*  $\frac{1}{8}$ – $\frac{1}{2}$  in., linear, pubescent or glabrous. *Capsule*  $\frac{1}{4}$  in., nearly glabrous, short-stalked, 4-seeded. *Seeds* hispid with ovate acute scales.—Perhaps not



distinct from the next. T. Anderson regards the presence of scattered solitary flowers in the lower axils as of specific importance, and has deviated from the results of the older botanists accordingly.

18. **J. tranquebariensis**, *Linn. f. Suppl.* 85; very woody, leaves  $\frac{1}{6}$ – $\frac{1}{2}$  in. orbicular or obovate puberulous or pubescent, bracts ovate or orbicular puberulous or pubescent, corolla  $\frac{1}{3}$  in. *Wall. Cat.* 2462; *T. Anders. in Journ. Linn. Soc.* ix. 513, partly. *Gendarussa tranquebariensis*, *Nees in Wall. Pl. As. Rar.* iii. 105; *Wight Ill.* t. 164 b, fig. 8, and *Id.* t. 462. *Adhatoda tranquebariensis*, *Nees in DC. Prodr.* xi. 399.

S. MADRAS and CEYLON, especially on hot dry low hills, frequent; *Wight, &c.*

A low, intricate undershrub; nodes very short. Inflorescence, corolla, capsule and seeds as of *J. glauca*.—Wight's figure represents a more diffuse plant with leaves considerably larger than in any of the specimens; it is a form intermediate between *J. glauca* & *tranquebariensis* as here understood; Col. Beddome believes these two not specifically distinct.

19. **J. salsoloides**, *T. Anders. in Journ. Linn. Soc.* ix. 514; branches softly white-hairy, leaves small spathulate or oblong subglabrous, bracts elliptic or oblong, corolla  $\frac{1}{4}$ – $\frac{1}{3}$  in. densely white-hairy.

CARNATIC and MYSORE; *Wight, G. Thomson.*

A rigid, much-branched, small undershrub; branches densely shortly hairy. Leaves sessile,  $\frac{1}{2}$ – $\frac{3}{4}$  in., obtuse. Spikes terminal, few-fl'd., with scattered solitary, often ebracteate flowers in the axils below; bracts  $\frac{1}{4}$  by  $\frac{1}{8}$  in.; bracteoles similar, smaller, or often 0. Sepals  $\frac{1}{6}$  in., linear-lanceolate, pubescent. Lower anther-cell tailed. Capsule  $\frac{1}{3}$  in., clavate, densely pubescent (T. Anderson).—Easily separated from *J. trinervis* (and its Var. *arenaria*) by the white-furred branches and narrower non-marginate bracts.

Sect. 3. **Calophanoides**. Flowers axillary, solitary clustered or in dense cymes, without a terminal spike or panicle. Calyx sub-5-partite. Corolla small. Seeds subtubercular or verrucose, not hispid.

\* Bracts obovate or spathulate (all perhaps var. of one).

20. **J. quadrifaria**, *Wall. Cat.* 2479; leaves shortly petioled elliptic acute at both ends puberulous on the nerves beneath, flowers in close axillary clusters, corolla  $\frac{1}{4}$ – $\frac{1}{3}$  in. *T. Anders. in Journ. Linn. Soc.* ix. 514, partly. *Gendarussa quadrifaria*, *Nees in Wall. Pl. As. Rar.* iii. 105. *Adhatoda quadrifaria*, *Nees in DC. Prodr.* xi. 396.

KHASIA and JAINTIA MTS., alt. 3000 ft.; *Wallich, &c.* ASSAM; *Griffith* (Kew Distrib. n. 6188).—DISTRIB. S. China.

Branches 2 ft., little divided, rusty-pubescent. Leaves  $3\frac{1}{2}$  by  $1\frac{1}{2}$  in., drying black, not or obscurely lineolate; petiole  $\frac{1}{3}$  in. Flowers 1–5-nate; bracts  $\frac{1}{3}$  in., spathulate, orbicular or emarginate, very rusty-pubescent; bracteoles similar, smaller, or 0. Sepals  $\frac{1}{4}$  in. and upwards, linear-lanceolate, lineolate, puberulous. Corolla hairy, white rose-spotted. Lower anther-cell white-tailed. Capsule  $\frac{1}{4}$  in., minutely pubescent, 4-seeded; solid pedicel very short. Seeds tubercular, verrucose, glabrous.

21. **J. Zollingeriana**, *Clarke*; leaves shortly petioled oblong acuminate at both ends nearly glabrous, flowers in close axillary clusters, corolla  $\frac{1}{3}$ – $\frac{1}{2}$  in. *J. quadrifaria*, *T. Anders. in Journ. Linn. Soc.* ix. 514, partly. *Adhatoda Zollingeriana*, *Nees in DC. Prodr.* xi. 396.

TENASSERIM; *Beddome*.—DISTRIB. Java.

Resembling *J. quadrifaria*, but much more glabrous. Branches minutely pubes-



cent. *Leaves* 4 by 1 in.; nerves conspicuous. *Bracts*  $\frac{1}{2}$  in., spathulate, orbicular, subglabrous. *Corolla* subglabrous.

22. **J. salicifolia**, *T. Anders. in Journ. Linn. Soc.* ix. 514; leaves subpetioled lanceolate acuminate at both ends glabrous or pubescent, flowers in close axillary clusters, corolla  $\frac{1}{2}$  in. minutely hairy.—*Adhatoda* sp. n. 20, *Herb. Ind. Or. H. f. & T.*

N. KHASIA MTS., alt. 3–5000 ft.; Borpani and Shillong, *H. f. & T.*, &c.

*Leaves*  $2\frac{1}{2}$  by  $\frac{1}{2}$  in.; petiole  $\frac{1}{12}$  in. *Bracts*  $\frac{1}{4}$  in., spathulate, orbicular, glabrous or sparsely pubescent.

23. **J. Neesiana**, *Wall.*; *T. Anders. in Journ. Linn. Soc.* ix. 513; leaves linear-lanceolate glabrous, flowers in close axillary clusters, corolla  $\frac{1}{4}$  in. *Gendarussa Neesiana*, *Wall. Cat.* 7175; *Nees in Wall. Pl. As. Rar.* iii. 105. *Adhatoda Neesiana*, *Nees in DC. Prodr.* xi. 397.

KHASIA MTS.; *Wallich.*

A small undershrub; internodes very short. *Leaves*  $1\frac{1}{2}$  by  $\frac{1}{4}$  in.; petiole hardly any. *Bracts* as in the 3 preceding species, which differ from the present by their diffuse habit and elongate internodes.

\*\* *Bracts lanceolate or linear-lanceolate.*

24. **J. flava**, *Kurz in Journ. As. Soc.* 1873, pt. ii. 97; subglabrous, leaves ovate or ovate acuminate; cymes small axillary densely subcapitate subglabrous, corolla  $\frac{1}{3}$ – $\frac{1}{2}$  in. pubescent yellow.

TENASSERIM; *Beddome*; Martaban (fide *Kurz*).

A herb, 2–3 ft., erect (*Kurz*). *Leaves* 4–6 in., acuminate at both ends, nerves prominent; petiole  $\frac{3}{4}$  in. *Cymes* forming axillary heads  $1\frac{1}{4}$  in. diam.; bracts and bracteoles small, linear, glabrous. *Sepals* 5,  $\frac{1}{4}$ – $\frac{1}{3}$  in., linear-lanceolate, caudate, glabrous. Lower *anther-cell* distinctly white-tailed. *Capsule*  $\frac{1}{2}$  in., clavate, glabrous, 4-seeded; seeds minutely rugulose (*Kurz*).—No specimen of *Kurz*'s plant has been seen, but his description fits very satisfactorily *Beddome*'s *Herb. Propr.* n. 84.

25. **J. Brandisii**, *T. Anders. in Journ. Linn. Soc.* ix. 514; leaves ovate acute pubescent on the nerves beneath, flowers sessile or sometimes aggregated on a very short peduncle, corolla pubescent tube short.

BURMA; Mt. Toungoo, *Brandis*, and Karen Hills, *Masson* (fide *T. Anderson*).

An undershrub, 1–2 ft.; stem terete, glabrous. *Leaves* scabrous above, puberulous beneath, decurrent into the petiole; nerves prominent, approximate. *Bracts* and *bracteoles* small, subulate. *Sepals* 5, equal,  $\frac{1}{8}$  in., subulate, hoary pubescent. Lower *anther-cell* long-tailed. *Ovary* 4-ovulate (*T. Anderson*).—Not seen. *Anderson* places it in a section with “flowers axillary solitary or 2 or 3 together,” along with *J. salicifolia* & *quadrifaria*. Nevertheless it may be *J. flaccida*, *Kurz*, of the Section *Gendarussa*.

26. **J. heterocarpa**, *T. Anders. in Journ. Linn. Soc.* vii. 41; leaves petioled ovate minutely lineolate subglabrous, flowers minute in small axillary clusters, capsules of 2 kinds in nearly every axil, abnormal winged crested 1-seeded. *Harnieria dimorphocarpa*, *Solms in Schweinf. Æthiop.* 110.

WESTERN INDIA; Deesa (Goojerat) and Kurrachee (Scinde), *Stocks*; Ferozepore (Punjab), *Vicary*.—DISTRIB. Abyssinia.

A herb, 8–12 in., minutely grey-pubescent. *Leaves* 1 by  $\frac{1}{2}$  in.; petiole  $\frac{1}{3}$  in. *Flowers* 1–4-nate, closely axillary; bracts and bracteoles small, linear. *Calyx* sub-5-partite; segments  $\frac{1}{8}$  in., linear, minutely pubescent. *Corolla*  $\frac{1}{2}$  in., upper lip shortly 2-lobed, lower transversely marked shortly 3-lobed. *Anther-cells* ovate; lower white-tailed.



Normal capsule  $\frac{1}{8}$ – $\frac{1}{6}$  in., ellipsoid, acute at each end, hardly stalked, pubescent, 4-seeded. *Seeds* papillose, subhispid; abnormal 1-celled, 1-seeded capsules occur  $\frac{1}{8}$  in., ellipsoid with 3–6 vertical crested wings, with seed ovoid, larger than in the normal, nearly smooth, on a nearly basal retinaculum.—The examples collected far apart show the heterocarpous capsules to be characteristic, not monstrous. The species is not nearly allied to any other; but as the inflorescence is axillary and the calyx 5-merous, it has been moved here so as to fortify the characters of the Section *Rostellaria*.

Sect. 4. **Gendarussa.** *Spikes* terminal and on short lateral branches (in *J. Hookeriana* axillary), interrupted; terminal often large, paniculate; bracts mostly narrow, lower rarely imbricate. *Calyx* sub-5-partite. *Flowers* small or middle-sized. *Seeds* (where known) verrucose or tubercular, glabrous, not glochidiate nor hispid.

27. **J. Gendarussa**, *Linn. f. Suppl.* 85; leaves short-petioled lanceolate glabrous, spikes puberulous or glabrous, bracts linear shorter than the calyx, corolla  $\frac{1}{2}$  in. *Jacq. Ecl.* t. 11; *Burm. Fl. Ind.* 10; *Roxb. Fl. Ind.* i. 128; *Blume Bijl.* 785; *Wall. Cat.* 2442; *Bot. Reg.* t. 635; *Blanco Fl. Fil.* 14; *Dalz. & Gibs. Bomb. Fl. Suppl.* 71; *T. Anders. in Journ. Linn. Soc.* ix. 513; *Kurz For. Fl.* ii. 247. *Gendarussa vulgaris*, *Nees in Wall. Pl. As. Rar.* iii. 104, and in *DC. Prodr.* xi. 410; *Wight Ic.* t. 468; *Decne. in Nouv. Ann. Mus. d'Hist. Nat.* iii. 382.—*Rumph. Herb. Amb.* iv. t. 28. *Rheede Hort. Mal.* ix. t. 42.

Throughout INDIA, from Bengal to Ceylon and Malacca, often an escape from cultivation.—DISTRIB. Malaya and China to the Philippines (? wild).

*Stems* 2–4 ft., erect. *Leaves* 4 by  $\frac{3}{4}$  in.; petiole  $\frac{1}{4}$  in. *Spikes* 2–5 by  $\frac{3}{4}$  in., terminal often forming a panicle; flowers clustered, lower clusters usually distant; bracts  $\frac{1}{8}$  in. *Sepals*  $\frac{1}{8}$  in. *Corolla* nearly glabrous, white or rose with purple spots. Lower *anther-cell* distinctly tailed. *Capsule*  $\frac{1}{2}$  in., clavate, glabrous, 4-seeded.—No capsule has been seen except on an example of Wight's; and that does not suffice for a description of the seed. This commonly cultivated plant is considered by Nees and T. Anderson wild in various parts of India, but the rarity of the seeds renders this doubtful. Col. Beddome says "wild on Mooleyit in Tenasserim."

28. **J. Hookeriana**, *T. Anders. in Thwaites Enum.* 233, and in *Journ. Linn. Soc.* ix. 513; leaves short petioled lanceolate glabrous, spikes simple or compound all axillary lax nearly glabrous, bracts linear or linear-spathulate mostly shorter than the calyx, corolla  $\frac{1}{3}$ – $\frac{1}{2}$  in. *Bedd. Ic. Pl. Ind. Or.* t. 268. *Adhatoda Hookeriana*, *Nees in DC. Prodr.* xi. 403. *Leptostachya zeylanica*, *Nees l. c.* 379.

CEYLON; *Macrae, Walker, &c.*

An undershrub, less erect, more branched than *J. Gendarussa*. *Leaves* as of *J. Gendarussa*. *Spikes* 2–7 in., simple or paniculate; flowers distant, solitary or opposite; bracts  $\frac{1}{8}$  in., linear, rarely spathulate; bracteoles  $\frac{1}{8}$  in., linear, or 0. *Flowers* nearly as of *J. Gendarussa*. *Capsule*  $\frac{1}{3}$  in., clavate, 4-seeded. *Seeds* verrucose, glabrous.—Beddome figures the inflorescence terminal, but in the examples the uppermost axils are sterile, many lower axils with spikes.

29. **J. decussata**, *Roxb. Hort. Beng.* 4, and *Fl. Ind. ed. Carey & Wall.* i. 128; leaves ovate or obovate pubescent or glabrate, panicle terminal large divaricate pubescent, flowers in distant clusters, corolla  $\frac{1}{3}$ – $\frac{1}{2}$  in. pubescent. *Wall. Cat.* 2476; *T. Anders. in Journ. Linn. Soc.* ix. 515. *Gendarussa decussata*, *Nees in Wall. Pl. As. Rar.* iii. 104. *Adhatoda decussata*, *Nees in DC. Prodr.* xi. 408.

PEGU and TENASSERIM, frequent; *Wallich, Griffith, &c.*



A shrub, 3-6 ft.; branches pubescent upwards. *Leaves* (upper cauline alone seen) 6-10 by 3-6 in., petioled ovate, or sessile spathulate-obovate, base auricled, punctulate, puberulous at least when young. *Panicles* 12-20 in. long and broad; branches long, subsimple, often recurved in fruit; clusters 2-8-fld., pubescent, lower often 1-3 in. apart; bracts  $\frac{1}{8}$  in., linear-lanceolate, but the clusters are often supported by reduced leaves  $\frac{1}{2}$ -1 in.; bracteoles  $\frac{1}{8}$  in., linear, often 0. *Sepals*  $\frac{1}{8}$ - $\frac{1}{6}$  in., linear-lanceolate, pubescent. Lower *anther-cell* distinctly white-tailed. *Capsule*  $\frac{2}{3}$  in., long-stalked, pubescent, 4-seeded. *Seeds* verrucose, glabrous.

30. **J. Helfer**, *Clarke*; leaves petioled elliptic acute at both ends glabrous, panicle terminal of 3 erect spikes, clusters of flowers distant pubescent, corolla  $\frac{1}{3}$  in. pubescent.

TENASSERIM or ANDAMANS; *Helfer* (Kew Distrib. n. 6185).

*Branch* woody, terete, glabrous. Upper *leaves*  $5\frac{1}{2}$  by 2 in., minutely lineolate on both surfaces; petiole  $\frac{1}{2}$  in. *Panicle* 3 in. diam., trichotomous, sparingly pubescent; lateral spikes curved, ascending; bracts  $\frac{1}{8}$ - $\frac{1}{6}$  in., linear-lanceolate, pubescent. *Calyx* and *corolla* as of *J. decussata*, but rather smaller.—This may be a small var. of *J. decussata*, as the example is poor; but the leaves do not match, and the curved ascending spikes are very unlike the habit of *J. decussata*.

31. **J. flaccida**, *Kurz in Journ. As. Soc.* 1870, ii. 80, and in *Flora* 1870, 364; leaves large sessile spathulate-elliptic nearly glabrous, panicles terminal very lax, flowers distant rarely clustered, corolla  $\frac{2}{3}$  in. nearly glabrous pale yellow or testaceous (*Kurz*).—Adhatoda n. 19, *Herb. Ind. Or. H. f. & T.*

PEGU; *M'Lelland, Kurz, Brandis.*

Annual, 1-2 ft., erect. *Leaves* opposite and ternate, 7-12 in., acuminate, lineolate above; petiole winged to the base, there often auriculate. *Panicle* often 12 in. long and broad, very thin flaccid, nearly glabrous; flowers opposite or alternate, lower often 1 in. apart; bracts hardly  $\frac{1}{8}$  in., linear-lanceolate. *Sepals*  $\frac{1}{8}$  in., linear-lanceolate, puberulous or glabrate. *Corolla* slender. Lower *anther-cell* white-tailed. *Capsule*  $\frac{2}{3}$  in., long-stalked, thinly pubescent, 4-seeded.

32. **J. wynaadensis**, *Wall. Cat.* 2474; leaves petioled elliptic acuminate at both ends pubescent or glabrous, spikes simple or compound axillary and terminal pubescent interrupted, flowers solitary opposite, bracts linear-lanceolate shorter than the calyx, corolla  $\frac{1}{3}$ - $\frac{1}{2}$  in. *T. Anders. in Journ. Linn. Soc.* ix. 515. *J. lineata*, *Wall. Cat.* 2486, second sheet. Gendarussa wynaadensis, *Nees in Wall. Pl. As. Rar.* iii. 104. Adhatoda wynaadensis, *Nees in DC. Prodr.* xi. 406; *Dalz. & Gibs. Bomb. Fl.* 194; *Wight Ic.* t. 1545.

S. DECCAN PENINSULA, alt. 1-3000 ft.; Wynaad, Belgaum, Coorg, &c., *Wight, Ritchie, &c.*

*Branches* elongate, terete, glabrescent; internodes long. *Leaves*  $4\frac{1}{2}$  by 2 in., pubescent beneath or glabrous; petiole  $\frac{3}{4}$  in. *Spikes* 2-4 in., somewhat dense in flower, elongate interrupted in fruit; bracts  $\frac{1}{8}$ - $\frac{1}{6}$  in.; bracteoles  $\frac{1}{8}$  in., linear. *Sepals*  $\frac{1}{2}$  in., linear, very pubescent. *Corolla* pubescent, purple. Lower *anther-cell* white-tailed. *Capsule*  $\frac{1}{2}$ - $\frac{2}{3}$  in., very pubescent, clavate, 4-seeded. *Seeds* verrucose, glabrous.—Very variable in indumentum; *Wight's* type, from the Nilgherries' base, has the leaves very pubescent beneath, and has been marked *Rhaphidospora* sp. by *T. Anderson*. *Dalzell's* specimens have the leaves glabrous beneath.

33. **J. vasculosa**, *Wall. Cat.* 2469; leaves ovate attenuate at both ends minutely crisped pubescent on the midrib beneath, flowers solitary opposite, corolla  $\frac{1}{3}$ - $\frac{1}{2}$  in. upper lip oblong entire lower pendent. *T. Anders. in Journ. Linn. Soc.* ix. 515. *Ruellia rivinæfolia*, *Wall. Cat.* 2413. Gen-



*darussa vasculosa*, *Nees in Wall. Pl. As. Rar.* iii. 104. *Adhatoda vasculosa*, *Nees in DC. Prodr.* xi. 407.

E. HIMALAYA and KHASIA Mts., alt. 2–5000 ft., common; *Wallich, H. f. & T.*, &c.

*Rootstock* perennial; branches 8–20 in., glabrous except at the tip. *Leaves* 5 by 2 in., punctulate above; petiole  $\frac{3}{4}$  in. *Spikes* 1–4 in., axillary and terminal, simple or paniculate, pubescent; bracts oblong or linear, mostly shorter than the calyx, pubescent; bracteoles similar to the bracts, but smaller. *Calyx* sub-5-partite; segments  $\frac{1}{8}$  in., lanceolate. *Corolla* pubescent, yellowish slightly pink-spotted; tube cylindric; upper lip hardly broader than one of the three lobes of the lower. *Anther-cells* divaricate, lower with a minute white appendage at the base. *Ovary* glabrous; style pubescent in the lower part. *Capsule* not seen, the abundant specimens all being in flower.—T. Anderson places this in *Raphidospora*, and in the absence of the seed it is impossible to prove he is wrong; but in the Sect. *Raphidospora*, the flowers are “laxly paniced,” as T. Anderson says.

VAR. ? *Parishii*; leaves glabrous, upper lip of corolla ovate  $\frac{1}{2}$  in. broad lower erect-patent.—Moulmein; *Parish*, n. 417. Tenasserim, Mooleyit; *Beddome*, n. 86.—This may be specifically distinct.

VAR. *Brandisii*; bracts (even in the upper part of the spikes) exceeding  $\frac{1}{4}$  in. elliptic-acuminate.—Pegu; Sitang, *Brandis*.—*Capsule*  $\frac{1}{2}$  in., narrowly cylindric, clavate, very hairy. *Seeds* roughly verrucose, glabrous.

34. **J. andrographioides**, *Clarke*; leaves ovate acuminate glabrous base rhomboid or rounded, flowers solitary opposite, corolla  $\frac{1}{2}$  in. both lips erect-patent.

TENASSERIM; Mooleyit, *Beddome*.

Closely resembling *J. vasculosa*, both in leaves and inflorescence, but the corolla as of *Andrographis*. *Leaves* 3 by 1 in. *Spikes* (all seen) solitary, terminal, simple, pubescent; bracts small linear, or the lower  $\frac{1}{2}$  in., linear-spathulate. Lower *anther-cell* with a microscopically small white spur.

35. **J. ptychostoma**, *Wall. Cat.* 2478; leaves ovate acuminate at both ends minutely pubescent on the nerves beneath, spikes axillary linear dense nearly glabrous, bracts minute, corolla  $\frac{1}{4}$ – $\frac{1}{3}$  in. *T. Anders. in Journ. Linn. Soc.* ix. 517? Gendarussa? sumatrana, *Miq. Fl. Ind. Bat.* ii. 832.

PENANG; *Wallich*.—DISTRIB. Sumatra.

Wallich's imperfect example is perhaps the same as *J. vasculosa* var. *Parishii* above. *Branches* slender, with long internodes, glabrous. *Leaves* 6 by  $2\frac{1}{2}$  in., nearly glabrous, closely lineolate above; petiole  $1\frac{1}{2}$  in. *Spikes*  $3\frac{1}{2}$  by  $\frac{1}{4}$  in., those seen all axillary, but there may have been also terminal spikes; bracts  $\frac{1}{16}$  in., ovate or lanceolate; bracteoles  $\frac{1}{10}$  in., linear-lanceolate. *Sepals*  $\frac{1}{8}$  in.—*J. ptychostoma*, *Nees in Wall. Pl. As. Rar.* iii. 108 (*Rhytiglossa*? *ptychostoma*, *Nees in DC. Prodr.* xi. 337), is founded on this Wallichian number, but the description of the bracts is so different from the example that there must have been some confusion.

36. **J. Maingayi**, *Clarke*; leaves ovate-lanceolate or narrowly lanceolate minutely pubescent on both surfaces, flowers solitary mostly alternate, corolla  $\frac{1}{3}$  in.

PENANG; *Maingay* (Kew Distrib. n. 1181).

A small shrub (*Maingay*); branches elongate, slender, glabrous except at the tips. *Leaves* 4 by  $\frac{1}{3}$ –1 in., very variable in breadth on the same branch, base cuneate; petiole  $\frac{1}{2}$  in. *Spikes* axillary and terminal, simple or divided, 2–3 in., slender, lax, pubescent; lower flowers distant, mostly alternate; bracts  $\frac{1}{8}$  in., linear-lanceolate, pubescent. *Calyx* and *corolla* nearly as of *J. vasculosa*, but upper corolla-lip ovate, broader. *Capsule*  $\frac{1}{3}$  in., stalk solidified.—The line between the small *Justicias* of this section and *Dianthera* is artificial, and the present species has quite the habit of others which have been removed by Bentham (in *Herb. Kew*) to *Dianthera*. It is



retained in *Justicia* because the white tail of the lower anther-cell, though small, is yet larger than in *J. vasculosa*, a species retained by name in *Justicia* by Bentham. —These small *Justicias* (*J. vasculosa*, *Maingayi*, &c.) form with *Dianthera collina*, &c., a very natural group; but they cannot be kept together unless we pull the Acanthaceæ all to pieces, and abolish anther-tails from the generic characters (which will be done some day).

**37. *J. flagelliformis*, Clarke**; leaves ovate attenuate at both ends minutely crisped pubescent on the midrib beneath, spikes linear, bracts and bracteoles lanceolate longer than the calyx, corolla  $\frac{1}{2}$  in.

TENASSERIM or ANDAMANS; *Helper* (Kew Distrib. n. 6172).

*Branches* elongate slender, glabrous except at the tips. *Leaves* 5 by 2 in., punctulate above; petiole  $\frac{2}{3}$  in. or frequently 0. *Spikes* 1–3, terminal, 3–5 by  $\frac{1}{4}$  in., wavy, subinterrupted below; bracts  $\frac{1}{4}$ – $\frac{1}{3}$  by  $\frac{1}{10}$  in., green, minutely pubescent; bracteoles nearly as long, narrower, subfalcate. *Calyx* sub-5-partite; segments  $\frac{1}{2}$  in., linear pubescent. *Corolla* nearly as of *J. vasculosa*; upper lip ovate subentire. Lower *anther-cell* white-tailed. *Capsule*  $\frac{1}{2}$  in., clavate.—The leaves closely resemble those of *J. vasculosa*, but the narrow subimbricate bracts are altogether different.

**38. *J. grossa*, Clarke**; leaves petioled large ovate glabrous, spikes terminal solitary linear pubescent, bracts elliptic or oblong often as long as the calyx, corolla  $\frac{1}{3}$  in.

MERGUI; *Griffith*.

*Branches* glabrous, with numerous large leaves near the tips. *Leaves* 8–10 by 4 in., acute, base rhomboid or obtuse; petiole 1 in. *Spike* 5 in., subsessile, interrupted below; bracts  $\frac{1}{4}$ – $\frac{1}{3}$  in., puberulous. *Sepals*  $\frac{1}{6}$  in., linear-lanceolate. *Anther-cells* subparallel, slightly divaricate at the base, one somewhat lower, both white-tailed at the base. *Ovary* glabrous, 4-ovulate; style minutely hairy below; stigma minute, subsimple. *Capsule* not seen.—This plant has been named by Nees *Phlogacanthus asperulus*, together with many others which he did not recognize. Wight marked it "*Hemichoriste?*"; and this is probably its true affinity, though its small flowers are opposed to it. It is nearly allied to *J. flagelliformis*.

**39. *J. boerhaaviæfolia*, T. Anders. in Journ. Linn. Soc. ix. 517**; leaves petioled ovate-lanceolate uppermost sessile cordate, spikes  $\frac{1}{2}$  in. secund on filiform dichotomous terminal branches, bracts subulate narrowly white-margined, corolla  $\frac{1}{6}$  in. purple in the throat.

TENASSERIM; Amherst, *Falconer* (fide T. Anderson).

A weedy herb; stem diffuse, terete, glabrous. *Cauline leaves* long-petioled, 2–5 in. long (petiole included); upper and floral leaves  $\frac{1}{2}$ – $1\frac{1}{4}$  by  $\frac{1}{4}$ – $\frac{1}{2}$  in.; all glabrous above, glaucous beneath. *Corolla* 2-lipped, glabrous, with 2 lines of recurved hairs in the throat. Upper *anthers* small, sterile. *Capsule*  $\frac{1}{8}$ – $\frac{1}{6}$  in., compressed, sterile part very short (T. Anderson).—Anderson was seldom wrong in generic determinations, but his description suggests that this is a *Rungia*.

Sect. 5. **Rhaphidospora.** *Flowers* laxly paniced. *Bracts* small linear or linear-lanceolate. *Seeds* retrorsely hispid.

**40. *J. glabra*, Koen.; Roxb. Hort. Beng. 4, and Fl. Ind. ed. Carey & Wall. i. 132**; leaves petioled ovate acute puberulous on the nerves or glabrate, cymes axillary and terminal, corolla  $\frac{1}{4}$  in. *Wall. Cat.* 2455; *T. Anders. in Journ. Linn. Soc. ix. 516.* *J. Careyana*, *Wall. Cat.* 2456. *Rhaphidospora glabra*, *Nees in Wall. Pl. As. Rar. iii. 115*, and in *DC. Prodr. xi. 499*; *Wight Ic. t. 1554*.

S. DECCAN PENINSULA; *Roxburgh, Wight.* CEYLON; *Walker, &c.*—DISTRIB. Java.



An erect, branched herb. *Leaves*  $1\frac{1}{2}$  by  $\frac{3}{4}$  in. (in one example  $4\frac{1}{2}$  by 1 in.), base attenuate or rounded; petiole  $\frac{1}{2}$ – $1\frac{1}{2}$  in. Axillary *peduncles* numerous,  $\frac{1}{2}$ – $1\frac{1}{2}$  in., divaricate; pedicels  $0$ – $\frac{1}{4}$  in., puberulous or pubescent; bracts and bracteoles minute. *Calyx-segments* scarcely  $\frac{1}{8}$  in., narrow, pubescent. *Corolla* upper lip erect, emarginate, lower pendent or reflexed. Lower *anther-cell* distinctly white-tailed. *Capsule*  $\frac{1}{2}$  in.; seed-bearing part subquadrate ellipsoid suddenly narrowed into the linear-cylindric pedicel.

41. **J. pubigera**, Wall. Cat. 2490; leaves short-petioled ovate lanceolate hairy on both surfaces, cymes axillary trichotomous, corolla  $\frac{2}{3}$  in. J. Edgeworthii, T. Anders. in Journ. Linn. Soc. ix. 516. Peristrophe pubigera, Nees in Wall. Pl. As. Rar. iii. 114, and in DC. Prodr. xi. 498. Rhaphidospora ciliata, Nees l. c. 500.

TEMPERATE N.W. HIMALAYA; Bhuddimath (Kumaon), Wallich, Royle; Simla, Madden; Gangootri, alt. 4500 ft., Strachey & Winterbottom; Mussoorie, alt. 7000 ft., W. S. Atkinson.

*Stems* herbaceous, erect, terete, hairy. *Leaves*  $2\frac{3}{4}$  by  $1\frac{1}{4}$  in., cuneate or rhomboid at the base; petiole  $\frac{1}{6}$  in. *Cymes* axillary, 2–3 in., somewhat rigid, dense, ascending, hairy; bracts  $\frac{1}{8}$ – $\frac{1}{6}$  in., linear; pedicels  $0$ – $\frac{1}{3}$  in.; bracteoles 0 or minute. *Calyx* sub-5-partite; segments  $\frac{1}{3}$  in., linear, pubescent. *Corolla* pubescent, purplish-red; lower lip  $\frac{1}{3}$  in., pendent. Lower *anther-cell* distinctly white-tailed. *Capsule*  $\frac{1}{2}$  in., linear-clavate, pubescent. *Seeds* unripe, probably glabrous, only slightly tubercular; in which case the species will not belong to Sect. *Rhaphidospora*. The inflorescence and corolla are exceedingly like *Peristrophe*; but the small bracts and distinct anther-tails do not suit.

Sect. 6. **Rostellularia** (Gen. Nees). *Spikes* terminal and axillary, cylindric or linear. *Bracts* and *bracteoles* narrowly lanceolate, usually about as long as the calyx. *Calyx* sub-4-partite (5th segment if sometimes present small), segments linear or linear-lanceolate. *Corolla* small. *Capsule* small, 4-seeded nearly from the base. *Seeds* subconcentrically tubercular or rugose or nearly smooth.—Small closely allied weeds, abundant in the tropics, all collected under 3 or 4 ill-defined species by T. Anderson. To facilitate their description it is necessary to arrange them in more species, or reduce them to vars. of one.

42. **J. micrantha**, Wall. Cat. 2449, partly; leaves ovate or elliptic, spikes short cylindric dense, sepals oblong scarious glabrous midrib green excurrent as a very hispid arista, seeds small concentrically rugose. J. procumbens, Linn.; T. Anders. in Journ. Linn. Soc. ix. 511, partly. Rostellularia crinita, Nees in Wall. Pl. As. Rar. iii. 101, and in DC. Prodr. xi. 373; Dalz. & Gibs. Bomb. Fl. 193.

DECCAN PENINSULA; Wight; Vingorla (S. Concan), Dalzell.

*Stems* much branched, minutely pubescent or hirsute. *Leaves*  $1\frac{1}{2}$  by  $\frac{3}{4}$  in., mature subglabrous or sparsely setose; raphides numerous sunk on both surfaces; petiole  $\frac{1}{6}$  in. *Spikes*  $\frac{1}{4}$ – $1\frac{1}{2}$  in.; bracteoles  $\frac{1}{3}$  in., sublinear. *Sepals* much wider than the bracteoles, nearly glabrous except the awns, hispid with many patent multicellular hairs. *Corolla*  $\frac{1}{4}$  in., rose-purple. *Capsule*  $\frac{1}{3}$  in., pubescent.—A strongly marked species, but it is difficult to settle the best name. Wallich's type sheet is mixed, and his name *micrantha* perhaps relates really to the small-fl. J. procumbens mixed thereon. As to the name J. crinita, that appears to relate chiefly to a mixture of J. procumbens var. *latispica* with J. diffusa var. *orbiculata*.

43. **J. quinqueangularis**, Koen.; Roxb. Fl. Ind. ed. Carey & Wall. i. 134; nearly glabrous, branches elongate, leaves linear or linear-lanceolate, spikes elongate  $\frac{1}{2}$  in. broad, sepals linear-oblong tip obtuse herbaceous glabrous, capsule  $\frac{1}{4}$ – $\frac{1}{3}$  in. stout. Wall. Cat. 2443, partly. J. peploides,



Var.  $\beta$  *angustifolia*, *T. Anders. in Journ. Linn. Soc.* ix. 511 (*excl. syn.* *J. Vahl.*). *Rostellularia quinquangularis*, *Nees in Wall. Pl. As. Rar.* iii. 101, and in *DC. Prodr.* xi. 375.

CENTRAL INDIA, common; from W. Bengal and Agra to Belgaum.

*Branches* often 20 in., rigid, 4-5-angular, geniculate; internodes long. *Leaves* 3 by  $\frac{1}{4}$ – $\frac{1}{3}$  in., glabrous, raphides obscure; petiole 0– $\frac{1}{8}$  in., puberulous. *Spikes* 1–6 in.; lower flowers usually opposite solitary, calyx just reaching to the next pair; bracts  $\frac{1}{4}$  in., linear-oblong, glabrous, scarious-margined; bracteoles similar, smaller. *Sepals*  $\frac{1}{4}$ – $\frac{1}{3}$  in., hardly broader than the bracteoles. *Seeds* much larger than in the neighbouring species, slightly concentrically tubercular-rugose.—*J. Vahl.*, Roth, resembles this in the narrow leaves.

VAR. *peplodes*; leaves oblong or ovate petiole often  $\frac{1}{4}$  in., spikes shorter often subovate when young. *T. Anders. in Journ. Linn. Soc.* ix. 511 (sp.); *Boiss. Fl. Orient.* iv. 525. *J. procumbens*, *Wall. Cat.* 2441, partly. *Rostellularia peplodes*, *Nees in Wall. Pl. As. Rar.* iii. 101, and in *DC. Prodr.* xi. 375; *Dalz. & Gibs. Bomb. Fl.* 193.—Throughout the Gangetic Plain, from the Punjab to Bengal, and through Central India to the Concan. Distrib. Afghanistan.—Usually much more branched than the type, sometimes small 3–6 in. diam. This var. is very unlike the type in general aspect, and does not graduate into it; but the obtuse glabrous sepal-tips and large capsule and seeds agree closely.

44. **J. notha**, *Clarke*; stems simple glabrous, leaves sessile oblong white-setulose on the nerves beneath, bracts elliptic, sepals linear-oblong white-setulose upwards. *Rostellularia simplex*, *Wight Ic.* t. 1542 (not *Justicia simplex*, D. Don).

INDIA?; *Herb. Wight.*

*Stems* 1 foot, slender, 4-5-angular. *Leaves*  $1\frac{1}{2}$  by  $\frac{1}{3}$  in., subobtuse at both ends, transversely lineolate glabrate above. *Spikes* 2 by  $\frac{1}{2}$  in., terminal, solitary, dense; bracts  $\frac{1}{4}$  by  $\frac{1}{8}$  in., setulose-ciliate on margins and midrib, otherwise glabrous. *Corolla*  $\frac{1}{3}$  in. *Capsule*  $\frac{1}{3}$  in., ellipsoid.—Wight gives no locality for this; it is a well-characterized plant, and probably Malayan.

45. **J. khasiana**, *Clarke*; stems elongate hispid, leaves sessile oblong hispid on both surfaces, bracts linear-oblong hispid, sepals sublinear hispid.

KHASIA MTS., alt. 5000 ft., common; *Griffith, H. f. & T., &c.*

*Stems*  $1\frac{1}{2}$ –3 ft., branched. *Leaves*  $1\frac{1}{2}$  by  $\frac{1}{2}$  in. *Spikes* 2–4 by  $\frac{1}{2}$  in., hardly interrupted at the base, very hispid; bracts  $\frac{1}{3}$  by  $\frac{1}{16}$ – $\frac{1}{12}$  in. *Corolla*  $\frac{1}{3}$ – $\frac{1}{2}$  in. *Capsule*  $\frac{1}{3}$  in., ellipsoid. *Seeds* undulate obscurely rugose; testa minutely reticulated.—Nearly allied to *J. notha*, but differing in the indumentum and narrower bracts.

46. **J. assamica**, *Clarke*; leaves sessile narrowly obovate obtuse glabrous, bracts narrowly oblong minutely hispid, sepals narrowly lanceolate hispidulous.

ASSAM; *Griffith* (Kew Distrib. n. 6159).

*Stems* prostrate, copiously rooting; flowering branches 3–4 in., numerous, erect, 1-spicate. *Leaves* 1 by  $\frac{1}{3}$  in., base long-cuneate; raphides sunk. *Spikes* 2 by  $\frac{1}{3}$  in., continuous, somewhat dense; bracts  $\frac{1}{6}$  by  $\frac{1}{16}$  in., scarious-margined. *Corolla* nearly  $\frac{1}{3}$  in. *Capsule*  $\frac{1}{3}$ – $\frac{1}{6}$  in., ellipsoid.—In the sessile leaves, large corolla, and small capsule, this is allied to *J. notha* and *J. khasiana*.

47. **J. Royeniana**, *Clarke*; leaves subsessile linear-oblong obtuse glabrous, bracts and sepals linear-lanceolate acute glistening bristle-ciliate. *Rostellularia Royeniana*, *Nees in DC. Prodr.* xi. 373; *T. Anders. in Thwaites Enum.* 234, partly.

CEYLON; *Walker, Thwaites.*



*Stems* 10–15 in., procumbent, branched, glabrous. *Leaves* 2 by  $\frac{1}{4}$  in., obtuse, transversely lineolate above; base long attenuate, petiole 0, or in some lower leaves short. *Spikes*  $2\frac{1}{2}$  by  $\frac{1}{2}$  in., subinterrupted at base, longer or shorter than the peduncle; bracts  $\frac{1}{3}$  by  $\frac{1}{20}$ – $\frac{1}{16}$  in., bracteoles  $\frac{1}{4}$  in. *Sepals*  $\frac{1}{4}$ – $\frac{1}{3}$  in., glistening ciliate on the margins and keel, otherwise glabrate. *Corolla*  $\frac{1}{3}$  in. *Capsule*  $\frac{1}{3}$  in.—Nearly allied to *J. notha*, differing principally in the glabrate leaves and very narrow bracts.

48. ***J. diffusa***, Willd. *Sp. Pl.* i. 87; leaves petioled elliptic acuminate at both ends sparsely hairy, spikes slender sparsely hairy, bracts linear-lanceolate or linear mostly shorter than the calyx, sepals lanceolate acute minutely scabrous upwards. *Roth Nov. Sp.* 14; *Wall. Cat.* 2444; *T. Anders in Journ. Linn. Soc.* ix. 512. *J. procumbens*, Linn. *partly*; *Vahl Symb.* ii. 14; *Roxb. Fl. Ind.* i. 132. *Rostellularia diffusa*, Nees in *Wall. Pl. As. Rar.* iii. 100, and in *DC. Prodr.* xi. 371; *Dalz. & Gibs. Bomb. Fl.* 193 (several of these citations referring partly or mainly to plants here separately described as vars.).

KUMAON and PUNJAB TERA; *Strachey & Winterbottom*, &c. DECCAN PENINSULA and CEYLON, plentiful; extending north to Chota Nagpore. RANGOON; *M'Leod*.—DISTRIB. Siam.

*Stems* 1–2 ft., herbaceous, quadrangular, glabrous or minutely pubescent. *Leaves* (well developed)  $3\frac{1}{2}$  by  $1\frac{1}{4}$  in.; raphides large, sunk, on both surfaces; petiole  $\frac{1}{4}$  in., pubescent. *Spikes* 1–7 by  $\frac{1}{2}$  in.; lower flowers opposite, distant the length of the calyx; bracts  $\frac{1}{6}$  in., narrowly or not scarious-margined, tip minutely scabrous; bracteoles  $\frac{1}{10}$ – $\frac{1}{8}$  in., lanceolate. *Sepals*  $\frac{1}{6}$  in., resembling the bracts. *Corolla*  $\frac{1}{4}$  in. *Capsule*  $\frac{1}{8}$ – $\frac{1}{6}$  in., glabrous. *Seeds* very nearly smooth, concentric rugosities remaining as obscure tubercles.

VAR. *prostrata*, Roxb. ms.; leaves smaller often obtuse or orbicular, bracts and sepals shorter broader rather more scabrous, capsule hairy.—Deccan Peninsula and Ceylon, common.—*Stems* prostrate, intricately branched, patently hairy. *Leaves*  $\frac{1}{4}$ – $\frac{1}{2}$  in. diam. *Spikes* 1–2 by  $\frac{1}{2}$  in.

VAR. *Vahlia*; leaves narrowly lanceolate or linear, bracts lanceolate white-margined, sepals lanceolate subacute tips minutely scabrous. *J. Vahlia*, *Roth Nov. Sp.* 14. *J. quinqueangularis*, *Wall. Cat.* 2443, *type sheet and mainly*. *J. Vahlia*, *Roem. & Sch. Syst. Mant.* i. 138. *Rostellularia Vahlia*, Nees in *Wall. Pl. As. Rar.* iii. 102, and in *DC. Prodr.* xi. 376, *partly*.—Deccan Peninsula and Ceylon, extending to Chota Nagpore, common.—It is vain to quote extensively synonymy for this plant, as the same specimen has been named differently by the highest authorities. The narrow-leaved forms have been, both by Nees and T. Anderson, mixed with *J. quinqueangularis*, which differs in the large capsule and seeds, and in the glabrous obtuse sepal-tips. In the linear-leaved forms the spikes, bracts and sepals are often as in *J. diffusa* var. *prostrata*. Connected by imperceptible gradations with *J. diffusa*, type.

VAR. *hedyotidifolia*; woody, leaves petioled ovate, spikes shortened dense, sepal-tips lengthened sometimes very ciliate. *J. hedyotidifolia*, *Wall. Cat.* 2450. *Rostellularia hedyotidifolia*, Nees in *Wall. Pl. As. Rar.* iii. 100, and in *DC. Prodr.* xi. 370; *Wight Ic.* t. 1540.—Mts. of S. India.—The extreme forms in Wight's herbarium are very woody and glabrous, with small black leaves; but there are herbaceous examples with larger more hairy leaves, even from the Nilgherries at 8000 ft. alt., which have been marked *J. hedyotidifolia* by Mr. Bentham, and which cannot be distinguished from *J. diffusa*, type.

VAR. *orbiculata*; leaves petioled ovate hairy specially beneath. *J. orbiculata*, *Wall. Cat.* 2489; *T. Anders. in Journ. Linn. Soc.* ix. 512, *partly*. *Rostellularia rotundifolia*, Nees in *Wall. Pl. As. Rar.* iii. 100, and in *DC. Prodr.* xi. 370.—Deccan Peninsula, northwards to Parasnath, *T. Anderson*. DISTRIB. Siam.—The examples are marked by Nees (doubtless on account of the pubescent or patently hairy stem) "*Rostellularia procumbens*, Var.  $\beta$  and  $\gamma$ ," but the same thing is marked by T. Anderson "*hedyotidifolia*," which is the true affinity. Most of the examples marked *orbiculata* by Nees and T. Anderson are *J. simplex*, D. Don.



49. **J. simplex**, *Don Prodr.* 118 (not *Rostellularia simplex*, Wight); leaves petioled ovate hairy or oblong, spikes cylindric dense hairy, bracts elliptic shortly acute scarious-marginate, sepals lanceolate acute hairy nearly to their base. *J. orbiculata*, *T. Anders. in Journ. Linn. Soc.* ix. 512, partly. *J. mollissima*, *Wall. Cat.* 2445. *J. procumbens*, *Wall. Cat.* 2441, partly; *T. Anders. in Journ. Linn. Soc.* vii. 40, not of *Linn.* *Rostellularia rotundifolia* & *mollissima*, *Nees in Wall. Pl. As. Rar.* iii. 100, 101, and in *DC. Prodr.* xi. 370, 373, partly. *R. abyssinica*, *Brongn.*, and *glandulosa*, *Nees in DC. Prodr.* xi. 372, 373.

WESTERN INDIA, alt. 2-5000 ft., in the hills, common; from Kashmir, Scinde Hills (*Stocks*), Nepal (*Wallich*), to the Nilgherries. Abundant in CENTRAL INDIA and CHOTA NAGPORE.—DISTRIB. Abyssinia, Malaya to the Loochoo Isles.

Herbaceous, hairy, branched; branches sometimes long as in *Wallich's* Nepal examples, whence *D. Don* took his unfortunate name. *Spikes* much broader and more hairy than in any var. of *J. diffusa*. *Bracts* usually as long as the calyx, green-keeled, very hairy with glistening many-jointed tawny or whiteish hairs.—Near *J. procumbens*, differing in its bracts; it is very uniform to its character, but the synonymy is uncertain, as the abundant examples are marked "*crinita*, *peploides*," &c., and the Abyssinian examples have several names.

VAR. *serpyllifolia*, *Benth. ms. in Hohenack.* n. 571; very small, leaves spikes bracts and flowers smaller.—Throughout the Deccan from Chota Nagpore to S. Madras, frequent.—*Leaves*  $\frac{1}{3}$  in. diam., elliptic or round, obtuse or subacute. *Spikes* 1 by  $\frac{1}{6}$  in.; bracts  $\frac{1}{6}$ – $\frac{1}{2}$  in., elliptic or broadly lanceolate, fulvous-hirsute.—Regarded by *Bentham* as a var. of *J. procumbens*, *Linn.*

50. **J. procumbens**, *Linn. Fl. Zeyl.* 19; leaves petioled elliptic or lanceolate hairy or glabrate, spikes cylindric dense hirsute, bracts linear-lanceolate acute, sepals sublinear acute hirsute nearly their whole length. *Roxb. Fl. Ind.* i. 132, partly; *Wall. Cat.* 2441, partly; *T. Anders. in Journ. Linn. Soc.* ix. 511, partly; *Benth. Fl. Austral.* iv. 549, with *Australian syn.* *J. micrantha*, *Wall. Cat.* 2449, chiefly. *J. hirtella*, *Wall. Cat.* 2448. *Rostellularia procumbens*, *Nees in Wall. Pl. As. Rar.* iii. 101, and in *DC. Prodr.* xi. 371, partly (excl. all Himalayan examples); *Dalz. & Gibs. Bomb. Fl.* 193. *R. adenostachya*, *Nees in Wall. Pl. As. Rar.* iii. 101, and in *DC. Prodr.* xi. 373.

S. DECCAN PENINSULA with CEYLON, frequent; extending north to the S. Concan.—DISTRIB. Malaya, Australia.—Separated from *J. simplex* by the narrower bracts; a character which at all events suits the geography better than the distinctions put forward by *Nees*, and accepted by *T. Anderson*.

VAR. *latispica*, *Clarke*; stouter, spikes larger, bracts and corolla longer. *Rostellularia procumbens*, *Wight Ic.* t. 1539. *R. mollissima*, *Nees in DC. Prodr.* xi. 373, partly.—Mts. of S. India and Ceylon, common. Khasia Mts. and adjacent parts of Assam, frequent. Pegu and Tenasserim.—*Bracts*  $\frac{1}{3}$ – $\frac{1}{2}$  by  $\frac{1}{20}$  in., hispid-ciliate. *Corolla*  $\frac{1}{3}$ – $\frac{1}{2}$  in. *Capsule*  $\frac{1}{8}$ – $\frac{1}{6}$  in.—The type of this var. is *Wight Ic.* t. 1539 (excellent), which shows the narrow bracts very correctly, and represents the common Nilgherry form: from this the Khasian and Malayan forms cannot be distinguished. In Ceylon a larger, more woody form is frequent; this is marked by *Nees R. procumbens* & *grandiflora*. The objection to calling this plant *mollissima* is that the type of *J. mollissima* (and *J. orbiculata*) was the round-leaved hairy Var. *vestita* of *J. diffusa*.

#### SPECIES NOT SEEN.

**J. BIFLORA**, *Vahl Symb.* ii. 9; leaves ovate, peduncles axillary 2-fld. as long as the leaves, bracts subulate. *Nees in DC. Prodr.* xi. 428.

INDIA; *Schumacher*.

A branched undershrub. *Leaves* 1 in., but little attenuate, base acute, very glabrous; petiole lax, lower as long as the leaves. *Peduncles* filiform; 2 petioled



bracts at the base of the unequal pedicels, oblong, acute; floral bracts 3 under each calyx, unequal; 2 subulate, the third ovate. *Calyx* 5-partite (Vahl).

*J. MORETIANA*, *Vahl Enum.* i. 162; leaves lanceolate, flowers solitary axillary and in a short bracteated terminal spike, calyx 5-toothed half the way down, corolla  $\frac{1}{2}$  in. 2-lipped, capsule  $\frac{1}{2}$  in. 4-seeded. *Nees in DC. Prodr.* xi. 428.—*Burm. Thes. Zeyl.* t. 3, fig. 1.

CEYLON; *Burmann*.

*Leaves*  $2\frac{1}{2}$  by  $\frac{2}{3}$  in., acute at both ends; petiole  $\frac{1}{8}$  in. Axillary flowers on peduncles  $\frac{1}{4}$  in., ebracteate; spicate flowers subsessile, bracts  $\frac{1}{3}$  in., oblong, acute. *Calyx*  $\frac{1}{8}$  in., toothed hardly half-way down, lobes subtriangular lanceolate. *Corolla* upper lip erect, ovate, subentire, lower pendent deeply 3-lobed. *Capsule* solid below.—The good picture of the capsule and seeds renders it nearly certain that this was some *Justicia*: the inflorescence is very nearly that of *J. glauca*, but the bracts are much too narrow and acute for that species.

### XXXIX. **ADHATODA**, *Nees*.

As *Justicia* Sect. *Betonica*, except that the anther-cells are acute, sometimes minutely apiculate, but scarcely spurred.—Species 6, Tropical; 1 Indian, 1 Cosmopolitan, 5 African or American.

Bentham (in *Gen. Plant.*) says of the anther-cells, “minime calcaratæ,” but this is an error, and the genus should be merged in *Justicia* Sect. *Betonica*, following *Nees* and *Anderson*.

1. ***A. vasica***, *Nees in Wall. Pl. As. Rar.* iii. 103, and in *DC. Prodr.* xi. 387; leaves elliptic acute at both ends entire minutely pubescent, spikes dense short, bracts ovate or obovate subacute puberulous or glabrate, corolla  $1\frac{1}{4}$  in. white tube short. *Dalz. & Gibs. Bomb. Fl.* 194. *Justicia Adhatoda*, *Linn.*; *Lamk. Ill.* t. 12, fig. 1; *Roxb. Fl. Ind.* i. 126; *Blume Bijdr.* 785; *Wall. Cat.* 2434; *Bot. Mag.* t. 861; *Griff. Notul.* iv. 140; *T. Anders. in Journ. Linn. Soc.* ix. 509.—*Adhatoda* sp. *Griff. Notul.* iv. 141, and *Id. Pl. As.* t. 424. *Rheede Hort. Mal.* ix. t. 43.

INDIA; from the Punjab and Assam to CEYLON and Singapore, common, frequently cultivated.—DISTRIB. Malaya, S.E. Asia.

A dense shrub, 4–8 ft.; sometimes arborescent, 20 ft. *Leaves* 8 by 3 in.; petiole 1 in. *Spikes* 1–3 in., terminal, often several together; bracts  $\frac{3}{4}$  by  $\frac{1}{4}$  in., elliptic; bracteoles  $\frac{1}{2}$  by  $\frac{1}{8}$  in., falcate-oblong. *Calyx*  $\frac{1}{3}$ – $\frac{1}{2}$  in., deeply 5-lobed; lobes equal, lanceolate. *Corolla-tube*  $\frac{1}{3}$ – $\frac{1}{2}$  in. broad; lips white, palate transversely rose-barred. *Stamens* glabrous; anther-cells acuminate at base, sometimes minutely white-tailed. *Ovary* and style-base minutely hairy. *Capsule*  $\frac{3}{4}$  in., clavate, pubescent, 4-seeded. *Seeds*  $\frac{1}{2}$  in. diam., glabrous, tubercular-verrucose.

2. ***A. Beddomei***, *Clarke*; leaves oblong attenuate at both ends entire minutely pubescent, spikes peduncled capitate, bracts ovate subacute puberulous or glabrate, corolla  $\frac{2}{3}$  in. creamy white tube short.

S. TRAVANCORE, alt. 3000 ft.; *Beddome*.

A very large shrub (*Beddome*). *Leaves* 6 by  $1\frac{1}{2}$  in.; petiole  $\frac{1}{2}$  in. *Peduncles*  $\frac{1}{2}$ – $\frac{3}{4}$  in., axillary, opposite, stout; heads 1 in. diam.; bracts  $\frac{1}{2}$  by  $\frac{1}{4}$ – $\frac{1}{3}$  in., narrowed at base; bracteoles  $\frac{1}{4}$ – $\frac{1}{3}$  in., narrowly oblong. *Calyx*  $\frac{1}{4}$  in., sub-5-partite; segments narrowly oblong, acute, minutely pubescent especially within. *Corolla* hairy; tube  $\frac{1}{4}$  in., broadly cylindric; lips oblong, upper emarginate, lower 3-lobed nearly to the base. *Filaments* stout, glabrous except at base; anther-cells superposed, lower obscurely tailed. *Ovary* glabrous, 4-ovulate; style hairy; stigma minutely bifid. *Capsule* not known.



**XL. RHINACANTHUS, Nees.**

Shrubs, sometimes subscandent. *Leaves* entire. *Panicle* divaricate or dense; flowers solitary (or in minute cymes), sessile; bracts and bracteoles small, linear-lanceolate. *Calyx* small, sub-5-partite, segments linear-lanceolate. *Corolla* white, tube very long narrowly cylindric, scarcely widened at the top; limb 2-lipped, upper lip lanceolate acuminate entire or shortly 2-lobed, recurved or twisted, lower broad 3-lobed. *Stamens* 2, inserted near the top of the corolla-tube; anthers 2-celled; cells superposed, muticous. *Ovary* 4-ovulate; style filiform, minutely bifid at the tip. *Capsule* clavate, 4-seeded, stalk long solid cylindric. *Seeds* ovoid, moderately compressed, glabrous, obscurely rugose or tuberculate.—Species 4, tropical Asiatic and African.

1. **R. communis**, *Nees in Wall. Pl. As. Rar.* iii. 109, and in *DC. Prodr.* xi. 442; leaves oblong or ovate-oblong pubescent or glabrate, panicle large spreading, calyx densely pubescent. *Wight Ill.* 164 bis, fig. 9, and *Ic.* t. 464; *Dalz. & Gibs. Bomb. Fl.* 194; *T. Anders. in Journ. Linn. Soc.* ix. 522. *Rh. Rottlerianus*, *Nees in Wall. Pl. As. Rar.* iii. 109, and in *DC. Prodr.* xi. 443. *Justicia nasuta*, *Linn.*; *Roxb. Fl. Ind.* i. 120; *Blume Bijdr.* 785; *Wall. Cat.* 2440; *Blanco Fl. Filip.* 14; *Bot. Mag.* t. 325; *Griff. Notul.* iv. 143. *J. Rottleriana*, *Wall. Cat.* 2477.—*Rheede Hort. Mal.* ix. t. 69.

Throughout INDIA, cultivated; perhaps wild in the Deccan Peninsula and CEYLON.—DISTRIB. Java, Madagascar, &c., cultivated.

*Leaves* 3–4 by  $\frac{3}{4}$ – $1\frac{1}{2}$  in., usually narrowed at both ends, margin undulate; petiole  $\frac{1}{3}$  in. *Cymes* terminal and on short lateral branches, dusky-pubescent; flowers often clustered; bracts and bracteoles 0– $\frac{1}{2}$  in., linear. *Calyx*  $\frac{1}{10}$  in. *Corolla-tube* 1 by  $\frac{1}{16}$  in.; lobes  $\frac{1}{3}$  in., 3 lower each twice as broad as the shortly bifid upper.

VAR. *montana*; leaves ovate softly hairy often furred beneath base frequently obtuse. *J. scandens*, *Vahl Symb.* ii. 7. *J. dichotoma*, *Rottl. & Willd. in Nov. Act. Nat. Cur.* iv. 221 (fide Nees). *Dianthera paniculata*, *Lour. Fl. Cochinch.* i. 26.—Mts. of S. Deccan, alt. 3–6000 ft., frequent.—Perhaps the wild state, of which the narrow-leaved glabrate *R. communis* is the domesticated form.

2. **R. calcaratus**, *Nees in Wall. Pl. As. Rar.* iii. 109, and in *DC. Prodr.* xi. 444; leaves large elliptic or narrow-obovate acuminate at both ends glabrous, panicle terminal somewhat dense flowers very many. *T. Anders. in Journ. Linn. Soc.* ix. 522. *Justicia calcarata*, *Wall. Pl. As. Rar.* ii. 9, t. 113, and *Cat.* 2426.

KHASIA MTS.; *Wallich, &c.* CACHAR; *Keenan*.

*Branches* stout. *Leaves* 10 by 4 in.; petiole  $1\frac{1}{2}$  in. *Panicle* 6 by 4 in., nearly glabrous; peduncle 1–2 in.; bracts  $\frac{1}{10}$  in. *Calyx*  $\frac{1}{8}$ – $\frac{1}{6}$  in., nearly glabrous; lobes linear-lanceolate. *Corolla* as of *R. communis*, but larger; tube  $1\frac{1}{4}$  in.; lobes  $\frac{1}{2}$  in.; upper lip subentire, or lobes minute setaceous, twisted. *Capsule* not seen.

**XLI. DIANTHERA, Linn.**

Diffuse herbs or undershrubs. *Leaves* petioled, ovate or oblong, puberulous or glabrate. *Spikes* or *panicles* terminal, axillary sometimes added; flowers, or many of the lower, distant; bracts and bracteoles small. *Calyx* sub-5-partite; segments narrow. *Corolla* small or middle-sized, white yellowish or rose-purple, 2-lipped; upper lip suberect emarginate, lower pendent, 3-lobed. *Stamens* 2, glabrous or nearly so; anther-cells 2, ellips-



oid, muticous, subopposite or superposed. *Ovary* glabrous or nearly so, 4-ovuled; style minutely hairy below, tip sub-bifid. *Capsule* clavate, 4-seeded, base subcylindric solid. *Seeds* compressed, scabrous verrucose or subhispid.—Species 80, chiefly American; about 10 in the tropics of the Old World.

The character of the genus is here narrowed to the Indian species, which differ from the small-flowered *Justicias* (*J. vasculosa*, &c.) only by having the lower anther-cell absolutely muticous.

*Flowers*  $\frac{1}{4}$ – $\frac{1}{3}$  in., sessile or nearly so.

1. ***D. leptostachya***, *Benth. in Gen. Pl.* ii. 1114; leaves elliptic or oblong narrowed at both ends puberulous on the nerves beneath or glabrate, bracts hardly  $\frac{1}{10}$  in. linear. *Ruellia leptostachya*, *Wall. Cat.* 2411. *Leptostachya Wallichii*, *Nees in Wall. Pl. As. Rar.* iii. 105, and in *DC. Prodr.* xi. 379, *the Indian plant only*; *Wight Ic.* t. 1543. *Justicia Wallichii*, *T. Anders. in Journ. Linn. Soc.* ix. 516.—*Adhatoda* sp. n. 17, *Herb. Ind. Or. H. f. & T.*

MTS. of S. DECCAN PENINSULA; Courtallum, &c., *Wight*, &c.

A herb; stem terete, puberulous. *Leaves*  $4\frac{1}{2}$  by  $1\frac{3}{4}$  in., punctulate on both surfaces; petiole  $\frac{1}{2}$ –2 in. *Spikes* linear, slender, interrupted, mostly collected in a terminal panicle 8–10 in. diam., puberulous; flowers opposite; pedicels 0– $\frac{1}{10}$  in., or the lower developed into very small cymes. *Calyx-segments*  $\frac{1}{10}$ – $\frac{1}{8}$  in., linear-lanceolate, puberulous. *Corolla* scarcely  $\frac{1}{4}$  in., nearly glabrous. *Capsule*  $\frac{1}{2}$  in., clavate, puberulous. *Seeds* glabrous, tubercular-verrucose.—The Philippine plant (Cuming, n. 548), combined with this species by Nees, is different, and probably not of this genus (fide Bentham).

2. ***D. virgata***, *Benth. in Gen. Pl.* ii. 1114; leaves elliptic narrowed at both ends pubescent on the nerves beneath, bracts ovate or elliptic acute as long as the calyx. *Justicia virgata*, *T. Anders. in Journ. Linn. Soc.* ix. 516, *chiefly*.—*Adhatoda* sp. n. 18, *Herb. Ind. Or. H. f. & T.*

SIKKIM and KHASIA Mts., alt. 1–3000 ft., frequent; *Griffith*, *H. f. & T.*, &c.

A somewhat slender herb, 2–3 ft. *Leaves*  $4\frac{1}{2}$  by  $1\frac{3}{4}$  in., acuminate, punctulate on both surfaces, base attenuate or rhomboid; petiole 1 in., pubescent. *Spikes* 3–6 in., linear, slender, interrupted, terminal, 1–3 together, or sometimes paniced; bracts  $\frac{1}{6}$  in.; flowers opposite, solitary, sessile. *Calyx* sub-5-partite; segments  $\frac{1}{3}$  in., linear-lanceolate, minutely pubescent. *Corolla*  $\frac{1}{4}$  in., white or slightly yellow-tinged. *Anther-cells* completely superposed. *Capsule*  $\frac{1}{2}$  in., clavate, puberulous. *Seeds* glabrous, tubercular-verrucose.—*Leptostachya virgata*, *Nees in Wall. Pl. As. Rar.* iii. 105, and *Cat.* 7177, and in *DC. Prodr.* xi. 379, from Ava, united with this by T. Anderson, has a very large panicle, cymose flowers and linear bracts, and seems much nearer *D. leptostachya*.

3. ***D. debilis***, *Clarke*; leaves cordate-lanceolate pubescent on the nerves beneath, bracts linear or linear-oblong shorter than the calyx.

KHASIA TERAI, alt. 500 ft.; Shaila, *Clarke*.

Resembling *D. virgata*, but very weak. *Leaves*  $4\frac{1}{2}$  by  $1\frac{3}{4}$  in., acuminate, membranous; petiole  $1\frac{1}{2}$  in. *Spikes* 1–3 in., linear, often 3 on a terminal peduncle 1–2 in.; bracts  $\frac{1}{12}$  in., pubescent; flowers opposite, solitary, distant. *Calyx* sub-5-partite; segments  $\frac{1}{8}$  in., linear, pubescent. *Corolla*  $\frac{1}{3}$  in., yellowish-white. *Anther-cells* parallel, one very slightly higher than the other. *Ovary* glabrous; base of style hairy. Young capsule as of *D. virgata*.

4. ***D. Griffithii***, *Benth. in Gen. Pl.* ii. 1114; leaves petioled ovate acute glabrous, panicles terminal trichotomous, bracts and bracteoles



minute subulate glabrous. *Justicia Griffithii*, *T. Anders. in Journ. Linn. Soc.* ix. 516.

MISHMEE HILLS; *Griffith* (fide T. Anderson).

A glabrous herb; stem terete, base woody, upwards herbaceous tetragonous. *Leaves* 4–10 by 2–4 in.; base decurrent. *Panicles* with elongate, ascending branches; flowers remote, opposite, solitary, sessile. *Sepals* 5, linear. *Corolla*  $\frac{1}{3}$  in., tube ventricose; limb 5-partite, green, lower lip spotted red. *Ovary* 4-ovulate. *Capsule* a little longer than the corolla, subclavate at the tip, acute (T. Anderson).—Not seen.

\*\* *Flowers*  $\frac{1}{2}$  in. or more, many distinctly pedicelled.

5. **D. collina**, *Clarke*; leaves ovate nearly glabrous, panicles terminal and axillary, anther-cells muticous distant superposed. *Justicia collina*, *T. Anders. in Journ. Linn. Soc.* ix. 515.

SIKKIM and BHOTAN, alt. 5–7000 ft.; *Griffith, H. f. & T., &c.* KHASIA MTS., alt. 4000 ft.; *Griffith*.

A diffuse herb, 1–2 ft., branches puberulous. *Leaves* 3 by  $1\frac{1}{2}$  in., acute, base cuneate or of the upper leaves almost rounded; petiole 1 in., or of the upper leaves sometimes 0. *Cymes* few-fl., running into an elongate terminal panicle by the gradual reduction of the leaves into bracts; proper bract hardly  $\frac{1}{10}$  in., linear; pedicels 0– $\frac{1}{4}$  in.; bracteoles minute or 0. *Sepals*  $\frac{1}{4}$  in., linear, green, glabrous. *Corolla*  $\frac{3}{4}$  in., white, nearly glabrous; tube elongate cylindric. *Capsule*  $\frac{1}{2}$  in., clavate, glabrous, 4-seeded. *Seeds* verrucose-scaly, obscurely hispidulous.

6. **D. dichotoma**, *Clarke*; leaves ovate acute nearly glabrous, panicles terminal minutely pubescent, anther-cells muticous one superposed for half its length. *Justicia dichotoma*, *Blume Bijl.* 783; *T. Anders. in Journ. Linn. Soc.* ix. 516. *Rhaphidospora dichotoma*, *Nees in DC. Prodr.* xi. 500. *Leptostachya dichotoma*, *Nees l. c.* 379. *Peristrophe dichotoma*, *Hassk. Cat. Hort. Bogor.* 152.

CEYLON (fide T. Anderson).—DISTRIB. Java, Philippines.

Much resembling *D. collina*, the corolla rather more ventricose and rose-purple.—There is no Ceylon example of this at Kew. We may suppose that T. Anderson had seen such at Calcutta; C. P. 2718, which he quotes, is certainly not this plant.

#### DOUBTFUL SPECIES.

D.? **INDICA**; leaves scarcely 1 in. rhomboid-ovate acute hairy, flowers congested into axillary and terminal decompound globose or oblong spikes, spikelets by suppression mostly 1-fl. supported by a lanceolate often empty bract. *Rhytiglossa?* *indica*, *Wawra in Oestr. Bot. Zeit.* 1881, 281, and *Bot. Reis. Pr. S. Cob.* 82, t. 9, fig. A.

GARWHAL; at Mussoorie, alt. 4000 ft., *Wawra*.

An undershrub; branches prostrate, variously twisted and incurved. Uppermost bract sterile, with the fertile valvately enclosing the single flower of the spikelet; bracteoles linear-setaceous, similar to the calyx-segments. *Corolla* ringent, rose, hairy; tube as long as the calyx; lips as long as the tube, upper ovate, emarginate; lower longer, cuneately 3-lobed. *Filaments* flattened; anther-cells superposed, ovate, muticous. *Style* capillary, elongate after flowering, bifid. *Ovary* 4-ovulate.—Not seen. I know of no woody prostrate Acanthaceous plant at Mussoorie, and do not understand the bracts as described.

#### XLII. **PTYSSIGLOTTIS**, *T. Anders.*

A small, procumbent herb. *Leaves* ovate, entire. *Spikes* peduncled, few-fl.; bracts and bracteoles linear. *Calyx* sub-5-partite; segments



linear. *Corolla-tube* short, limb 2-lipped; upper lip shortly 2-fid, lower 3-lobed; lobes imbricate in bud. *Stamens* 2; anthers 2-celled; cells ellipsoid, parallel, approximate, muticous or base minutely apiculate. *Ovary* 4-ovulate; style filiform, minutely bifid. *Capsule* clavate, 4-seeded. *Seeds* compressed, orbicular, verrucose-scaly, almost muricate, not hairy.

**P. radicata**, T. Anders. in *Thwaites Enum.* 235, excl. syn.; *Bedd. Ic. Pl. Ind. Or.* t. 267. *Rhytiglossa radicata*, Nees in *DC. Prodr.* xi. 344.

CEYLON; Champion, *Thwaites*.

*Stems* 3–8 in., weak, rooting, branched, puberulous. *Leaves*  $\frac{3}{4}$  by  $\frac{1}{3}$  in., obtuse or subacute at either end, lineolate, nearly glabrous; petiole  $\frac{1}{16}$ – $\frac{1}{6}$  in. *Peduncles*  $\frac{1}{4}$ –1 in., terminal, slender; spikes  $\frac{1}{4}$ – $\frac{1}{3}$  in.; bracts  $\frac{1}{3}$  in. *Sepals*  $\frac{1}{6}$  in. *Corolla*  $\frac{1}{3}$ – $\frac{1}{2}$  in., nearly straight, pubescent. *Capsule*  $\frac{1}{3}$  in., 4-seeded near the top; stalk solid, linear-cylindric.—*Rostellularia sarmentosa*, Zoll., described as having the capsule 4-seeded nearly from the base, does not belong here (cf. Benth. in *Gen. Pl.* ii. 1118).

#### XLIII. SPHINCTACANTHUS, Benth.

An erect, glabrous shrub. *Leaves* large, toothed or subentire. *Spikes* interrupted, forming a terminal panicle; flowers opposite; bracts and bracteoles small. *Calyx* sub-5-partite; segments linear. *Corolla-tube* ovoid, inflated, constricted at the top; limb 2-lipped, upper emarginate, lower 3-lobed pendent; lobes imbricated in the bud. *Stamens* 2; anthers 2-celled; cells oblong, approximate, muticous. *Ovary* 4-ovulate; style linear, minutely bifid. *Capsule* unknown.

**S. Griffithii**, Benth. in *Gen. Pl.* ii. 1118; *Hook. Ic. Pl.* t. 1205. *Justicia orchioides*, Griffith ms.

MISHMEE MTS., or PATKOYE HILLS in S.E. Assam; Griffith (Kew Distrib. n. 6161).

*Leaves*  $7\frac{1}{2}$  by  $3\frac{1}{4}$  in., acute at both ends; petiole 1 in. *Panicle* 5 by 4 in.; branches opposite; bracts  $\frac{1}{10}$  in. *Calyx*  $\frac{1}{10}$  in. *Corolla-tube*  $\frac{1}{6}$  by  $\frac{1}{12}$  in.; lobes  $\frac{1}{8}$ – $\frac{1}{6}$  in., those of the lower lip subacute. *Filaments* glabrous, except near the base.

#### XLIV. ECBOLIUM, Kurz.

A small, nearly glabrous, shrub. *Leaves* entire. *Spikes* terminal, dense; bracts large, imbricate, somewhat 4-ranked; bracteoles small, narrow. *Calyx* sub-5-partite; segments equal, narrow. *Corolla-tube* long, subfiliform; limb 2-lipped; upper lip narrow shortly bifid, lower 3-lobed pendent; lobes imbricate in bud. *Stamens* 2, attached near the top of the corolla-tube; anthers 2-celled; cells oblong, parallel, approximate, muticous. *Ovary* 4-ovulate; style filiform, very shortly bifid. *Capsule* long-stalked, ovoid, compressed, 4-seeded. *Seeds* 4 or more often 2, large, compressed, orbicular, tubercular-scabrous.

**E. Linneanum**, Kurz in *Journ. As. Soc.* 1871, pt. ii. 75; leaves petioled ovate or lanceolate, bracts ovate obtuse entire puberulous or pubescent, corolla greenish-blue or purplish. *Boiss. Fl. Orient.* iv. 526. *Justicia Ecbolium*, Linn.; *Roxb. Fl. Ind.* i. 114; *Wall. Cat.* 2432; *Bot. Mag.* t. 1847; *Wight Ic.* t. 463; *Nees in Wall. Pl. As. Rar.* iii. 108, and in *DC. Prodr.* xi. 427; *Dalz. & Gibs. Bomb. Fl.* 194. *J. ligustrina*, Vahl *Enum.* i. 118. *J. emarginata*, Nees in *DC. Prodr.* xi. 427. *Eranthemum Ecbolium*, T. Anders. in *Thwaites Enum.* 235, and in *Journ. Linn. Soc.* ix. 523.—*Burm. Thes. Zeyl.* 7, t. 4, fig. 1. *Rheede Hort. Mal.* ii. t. 20.



S. DECCAN PENINSULA and CEYLON. MALACCA; *Maingay*.—DISTRIB. Arabia, Abyssinia, Madagascar.

*Branches* pubescent upwards. *Leaves* 4 by  $1\frac{3}{4}$  in., cuneate or rhomboid at both ends, puberulous or pubescent on the nerves; petiole  $\frac{1}{4}$  in. *Spikes*  $2\frac{1}{2}$  by  $\frac{3}{4}$  in., dense; bracts  $\frac{3}{4}$  by  $\frac{1}{3}$ – $\frac{1}{2}$  in., sometimes softly hairy; bracteoles scarcely  $\frac{1}{4}$  in., sublinear. *Calyx*  $\frac{1}{4}$  in., pubescent. *Corolla* pubescent; tube  $1$ – $1\frac{1}{4}$  by  $\frac{1}{8}$  in.; lobes  $\frac{1}{2}$  in. *Stamens* glabrous, except the base of the filaments; anther-cells submucronate at the base. *Ovary* hairy at the tip. *Capsule-stalk*  $\frac{1}{8}$  in., linear-cylindric, seed-bearing part  $\frac{1}{3}$  in. diam. *Seeds*  $\frac{1}{4}$  in. diam., pale-coloured.—This, the typical form, is stated by Wight to be frequent in S. Madras, but there is very little of it in the Herbarium.

VAR. *rotundifolia*; leaves sessile ovate or roundish, bracts subdentate often with a very short acumination. *Justicia rotundifolia*, *Nees ll. c.*—Coimbatore; *Wight*, nn. 2008, 2266.—A woody undershrub, with shortened internodes and smaller leaves; Wight's are the only examples at Kew.

VAR. *lætevirens*; glabrescent, leaves larger petioled broadly lanceolate acute at both ends, spikes often 6–8 in. more lax, bracts  $\frac{2}{3}$  by  $\frac{1}{2}$  in. broadly lanceolate entire dusky-pubescent. *Justicia lætevirens*, *Vahl Enum. i.* 118; *Nees in DC. Prodr. xi.* 427.—S. Deccan Peninsula and Ceylon.—This appears the common South Indian form, and when the bracts become denticulate it passes by degrees into the next.

VAR. *dentata*; glabrescent, leaves larger petioled ovate or lanceolate acute, spikes dense, bracts  $\frac{3}{4}$  by  $\frac{1}{4}$ – $\frac{1}{3}$  in. ovate acuminate toothed. *Justicia dentata*, *Klein*; *Nees in Wall. Pl. As. Rar. iii.* 108, and in *DC. Prodr. xi.* 427. *J. livida*, *Nees in DC. Prodr. xi.* 427; *Wight Ic. t.* 1546.—Bengal, Assam and Pegu, very common. W. Deccan Peninsula, *Wight*, *Ritchie*.—The Bengal form has glabrate thin bracts, and a lurid or steely green-blue corolla. The Malabar form should perhaps be referred to Var. *lætevirens*.

#### XLV. **GRAPTOPHYLLUM**, *Nees*.

Glabrous shrubs. *Leaves* often variegated. *Flowers* pedicelled, clustered; clusters forming terminal thyrses; bracts and bracteoles very small, narrow. *Calyx* small, sub-5-partite; segments equal, linear-lanceolate. *Corolla-tube* curved; limb 2-lipped, upper lip shortly 2-fid, lower 3-lobed. *Stamens* 2, 2 minute staminodes added; anthers oblong, 2-celled; cells parallel, muticous. *Ovary* 4-ovulate; style filiform, scarcely bifid. *Capsule* oblong, hard, contracted into a long stalk. *Seeds* usually 2, orbicular or subquadrate, compressed flat, lacunose-rugose.—Species 4, Australian or Pacific, one long time cultivated.

**G. hortense**, *Nees in Wall. Pl. As. Rar. iii.* 102, and in *DC. Prodr. xi.* 328; leaves petioled broadly elliptic narrowed at both ends entire, corolla  $1$ – $1\frac{1}{3}$  in. crimson. *T. Anders. in Journ. Linn. Soc. ix.* 523. *G. pictum*, *Griff. Notul. iv.* 139. *Justicia picta*, *Linn.*; *Roxb. Fl. Ind. i.* 117; *Wall. Cat.* 2438; *Blume Bijl. 784*; *Blanco Fl. Filip. 12*; *Bot. Mag. t.* 1870; *Bot. Reg. t.* 1227; *Dalz. & Gibs. Bomb. Fl. Suppl. 71*.—*Rheede Hort. Mal. vi. t.* 60. *Rumph. Herb. Amb. iv. t.* 30.

Throughout INDIA and MALAYA cultivated; where wild, uncertain.

*Leaves*  $4\frac{1}{2}$  by  $1\frac{3}{4}$  in.; petiole  $\frac{1}{4}$  in. *Pedicels* often  $\frac{1}{4}$  in. *Calyx*  $\frac{1}{8}$  in. The description of the capsule and seeds is taken from "Gen. Plant."

#### XLVI. **RUNGIA**, *Nees*.

Diffuse or erect herbs, or shrubs. *Leaves* entire. *Spikes* dense, terminal or axillary, 1-sided; bracts 2-ranked, or 4-ranked, with 2 of the ranks often flowerless; flowering bracts often scarious-margined; bracteoles



similar to the bracts or narrow. *Calyx* small, deeply 5-lobed; segments linear-lanceolate. *Corolla* small, blueish or white; limb 2-lipped, upper lip emarginate shorter than the lower 3-lobed lip. *Stamens* 2; anthers 2-celled, cells parallel subequal, or more often superposed, lower cell muticous or white-tailed. *Ovary* 4-ovulate; style filiform, minutely bifid. *Capsule* ovoid or oblong, shortly stalked; after dehiscence the placentæ with the retinacula rise elastically from the base of the capsule, scattering the seeds. *Seeds* 4, compressed, orbicular, glabrous, verrucose, sometimes minutely, sometimes very strongly, so that the seed is concentrically rugose or subcristate.—Species 20, mostly Asiatic, a few Tropical African.

I am unable to make sections of this genus; the species are described in order of their size, beginning with the largest.

1. **R. sisparensis**, *T. Anders. in Journ. Linn. Soc.* ix. 518; leaves large elliptic acuminate at both ends glabrous, bracts dimorphic bifarious ovate subacute not acuminate glabrous, corolla  $\frac{1}{3}$ – $\frac{1}{2}$  in. *Adhatoda sisparensis*, *Benth. in Pl. Hohenack.* n. 1436.

NILGHERRIES; Sispara, *Wight, Gardner, &c.*; Valla Caudoo, *Wight*; Wynaad, *Beddome*.

Shrubby, nearly glabrous. *Leaves* 6 by  $1\frac{3}{4}$  in., obscurely lineolate; petiole 1 in. *Spikes* 2–3 by  $\frac{3}{4}$  in., 1-sided, 2 series of large empty bracts on one side, 2 series of smaller flowering ones on the other; empty bracts  $\frac{1}{2}$  by  $\frac{1}{4}$  in., narrowed at both ends, shining green, not or very narrowly marginate, striate; flowering bracts similar but hardly half so large, subscariose, more acute; bracteoles  $\frac{1}{8}$  in., lanceolate. *Calyx*  $\frac{1}{6}$  in.; segments linear-lanceolate, minutely pubescent. *Anther-cells* separated, lower white-tailed. *Capsule*  $\frac{1}{4}$ – $\frac{1}{3}$  in., minutely pubescent. *Seeds* verrucose, almost tubercled.

2. **R. Wightiana**, *Nees in Wall. Pl. As. Rar.* iii. 110, and in *DC. Prodr.* xi. 472; leaves large lanceolate or ovate-lanceolate glabrous, bracts dimorphic obscurely 2-ranked round-ovate prominently margined nearly glabrous, corolla  $\frac{1}{3}$  in. *Wight Ic.* t. 1549; *T. Anders. in Journ. Linn. Soc.* ix. 518. *R. Arnottiana*, *Wight Ic.* t. 1550. *Justicia Wightiana*, *Wall. Cat.* 2472.

S. DECCAN PENINSULA; Courtallum, *Wight, G. Thomson*; Attramallay, *Beddome*.

*Leaves*  $6\frac{1}{2}$  by 2 in., base attenuate, lineolate; petiole  $1\frac{1}{2}$  in. *Spikes* 2 by  $\frac{1}{2}$  in., somewhat laxly imbricate, often paniced; empty bracts  $\frac{1}{4}$  in. diam., obtuse rarely minutely apiculate; flowering bracts rather narrower, somewhat obovate; bracteoles  $\frac{1}{8}$  in., subovate, pubescent. *Calyx*  $\frac{1}{8}$ – $\frac{1}{6}$  in.; segments linear-lanceolate, minutely pubescent. *Anther-cells* superposed, lower white-tailed. *Capsule*  $\frac{1}{3}$  in., minutely pubescent. *Seeds* subtubercular verrucose.—*R. Arnottiana*, *Wight*, differs only in the uppermost leaves being as broad as the middle cauline.

3. **R. læta**, *Clarke*; leaves ovate acute at both ends subglabrous, bracts large broadly elliptic acute marginate ciliate, corolla  $\frac{2}{3}$  in.

S. DECCAN PENINSULA (?); *Herb. Wight*.

*Leaves*  $2\frac{1}{4}$  by  $1\frac{1}{4}$  in.; petiole  $\frac{1}{4}$  in. *Peduncles*  $\frac{1}{4}$  in., axillary; spikes  $1\frac{1}{2}$  by  $\frac{2}{3}$  in.; bracts sub-4-seriate, all fertile,  $\frac{2}{3}$  by  $\frac{1}{3}$  in., narrowed at base; margin prominent, scarious, purplish; bracteoles  $\frac{1}{3}$  in., linear, glabrous. *Calyx*  $\frac{1}{4}$  in.; segments linear-lanceolate, puberulous. *Anther-cells* oblong, contiguous, parallel, one scarcely lower than the other, slightly whitened, not tailed at the base. *Ovary* glabrous, subglandular, style hairy near the base. *Capsule* not seen.—This appears much the finest species in the genus, but there is only a branchlet in *Herb. Wight*.

4. **R. latior**, *Nees in DC. Prodr.* xi. 472; scabrous-pubescent, leaves



petioled ovate or broad-lanceolate, spikes ovoid or oblong dense often clustered, bracts roundly obovate margined hairy, bracteoles obovate margined, corolla  $\frac{1}{3}$  in. *Wight Ic. t.* 1548; *T. Anders. in Journ. Linn. Soc.* ix. 518 (*except the Ceylon plant*). *R. longifolia*, *T. Anders. in Thwaites Enum.* 235, *partim*.

MTS. of S. DECCAN PENINSULA; *Wight, Gardner, &c.*

*Stems* herbaceous, hairy.. *Leaves*  $2\frac{3}{4}$  by  $1\frac{1}{4}$  in., cuneate at both ends; petiole  $\frac{1}{2}$  in. *Spikes* 1 by  $\frac{1}{2}$  in.; bracts obscurely 4-seriate (many barren more or less unlike the fertile),  $\frac{1}{4}$  by  $\frac{1}{2}$  in., obtuse rarely apiculate; bracteoles similar to the bracts, but smaller. *Calyx*  $\frac{1}{8}$  in.; segments linear-lanceolate, softly hairy. *Anther-cells* superposed, lower white-tailed.. *Capsule*  $\frac{1}{8}$  in., nearly glabrous. *Seeds* small, minutely glandular-verrucose, ultimately glabrous.—This is not allied to *R. repens* as Nees supposed, but may be a var. of *R. longifolia*, as T. Anderson first supposed.

5. ***R. longifolia***, *Nees & Arn. in DC. Prodr.* xi. 471, *excl. Philippine example, not of Beddome*; nearly glabrous, leaves linear-lanceolate, spikes shortly oblong often clustered, bracts biform fertile roundly obovate marginate minutely pubescent, corolla  $\frac{1}{3}$  in. *T. Anders. in Journ. Linn. Soc.* ix. 517, *chiefly*.

CEYLON; *Walker, &c.*

*Leaves* 4 by  $\frac{1}{2}$  in. Flowerless bracts in 2 ranks on one side of the spike, ovate-lanceolate, obscurely margined. Otherwise as *R. latior*, from which this typical form of *R. longifolia* is easily separable: not so the

VAR. *latifolia*, *Wight ms.*; leaves lanceolate or ovate-lanceolate, barren bracts few less distinctly 2-ranked less unlike the fertile. *R. latior*, *Nees & T. Anders. in herb. partim*.—Ceylon, numerous examples. S. Travancore; *Beddome*.—I follow *Wight* (in preference to *Nees* and *T. Anderson*) in regarding all the Ceylon forms as one species, of which the S. Indian is an allied species, or a variety.. *T. Anderson* divided *Thwaites n.* 89 between *R. latior* and *R. longifolia*, depending upon the breadth of the leaves alone.

6. ***R. crenata***, *T. Anders. in Journ. Linn. Soc.* ix. 518; leaves petioled ovate-lanceolate sparsely hairy, spikes short dense 1-sided, bracts markedly biform barren oblong acute mucronate fertile orbicular marginate, corolla  $\frac{1}{2}$  in. *Rungia sp. n.* 9, *Herb. Ind. Or. H. f. & T.*

W. DECCAN PENINSULA; Canara, *Law*; Concan, *Stocks*; Belgaum, *Ritchie*.

*Stem* herbaceous, ramous, nearly glabrous. *Leaves*  $2\frac{1}{4}$  by 1 in., base shortly acuminate, sparsely laxly hairy on both surfaces, finally scabrid lineolate glabrate; petiole  $\frac{1}{4}$  in. *Spikes* 1 by  $\frac{2}{3}$  in., terminal, or sessile quasi-axillary clustered; flowerless bracts in 2 regular series on one side the spike,  $\frac{1}{3}$  by  $\frac{1}{10}$  in., green, striate, not or very narrowly margined; flowering bracts  $\frac{1}{8}$  in. diam., somewhat hairy; bracteoles  $\frac{1}{8}$  in., obovate, scarious-margined. *Calyx*  $\frac{1}{8}$  in.; segments linear-lanceolate, pubescent. *Capsule* scarcely  $\frac{1}{8}$  in., pubescent.—Allied to *R. parviflora*, *Nees*, but with much longer flowerless bracts.

7. ***R. stolonifera***, *Clarke*; leaves petioled ovate minutely scabrid-pubescent, bracts ovate minutely hairy, calyx glabrous, corolla tubular  $\frac{1}{2}$ – $\frac{2}{3}$  in., anther-cells white-tailed. *Dicliptera sp. n.* 14, *Herb. Ind. Or. H. f. & T.* *Justicia sp.* (Sect. *Rostellularia*), *Benth. ms. in Herb. Kew.*

KHASIA MTS., alt. 2–5000 ft.; *H. f. & T., &c.*

*Stems* 18 in., procumbent, rooting, branched; many small-leaved barren branches from the lower nodes. *Leaves* 1–3 by  $\frac{3}{4}$ – $1\frac{1}{2}$  in., cuneate at both ends, undulate sometimes sinuate, with few minute scattered hairs on both surfaces; petiole  $\frac{1}{2}$  in. *Spikes*  $\frac{1}{2}$ – $1\frac{1}{2}$  in., terminal and quasi-axillary, imperfectly 2–4-farious; bracts  $\frac{1}{2}$  by  $\frac{1}{8}$  in., sub-obtuse, scarious-margined; bracteoles oblong, nearly as long as the bracts. *Calyx*  $\frac{1}{8}$  in., deeply 5-partite; segments narrowly lanceolate, scarious. *Corolla-tube*  $\frac{1}{3}$  by



$\frac{1}{2}$  in., narrowly cylindric, straight; limb  $\frac{1}{8}$  in., 2-lipped; upper lip erect, subentire, lower pendent. *Capsule*  $\frac{1}{8}$ – $\frac{1}{6}$  in., nearly glabrous; placentæ rising elastically from the base. *Seeds* minutely glandular-papillose, glabrate when fully ripe.

8. ***R. khasiana***, *T. Anders. in Journ. Linn. Soc.* ix. 518; leaves petioled ovate or elliptic minutely scabrid-pubescent, bracts ovate acuminate somewhat pubescent, calyx minutely pubescent, corolla  $\frac{1}{4}$ – $\frac{1}{3}$  in. *Rungia* sp. n. 11, *Herb. Ind. Or. H. f. & T.* Acanthacea, *Griff. Itin. Notes*, 36, n. 589.

KHASIA MTS., alt. 3000 ft.; *Griffith* (Kew Distrib. n. 6165), *H. f. & T.*

Much branched; branches 10 in., pubescent, or with deflexed hairs. *Leaves*  $3\frac{1}{4}$  by  $\frac{3}{4}$ – $1\frac{1}{2}$  in., cuneate at both ends; petiole  $\frac{1}{3}$  in. *Spikes* 1–2 in., terminal and on short lateral branches, quadrifarious; bracts  $\frac{1}{3}$ – $\frac{1}{2}$  by  $\frac{1}{4}$  in., acutely or long acuminate, scarious-margined, nervose; bracteoles  $\frac{1}{3}$  in., linear. *Calyx* scarcely  $\frac{1}{4}$  in., segments narrowly linear. *Anther-cells* superposed, muticous. *Capsule*  $\frac{1}{3}$  in., pubescent, placentæ rising elastically from the base. *Seeds* minutely verrucose.

9. ***R. himalayensis***, *Clarke*; leaves long-petioled ovate minutely scabrid-pubescent, spikes slenderly peduncled 4-farious secund, bracts ovate shortly acuminate somewhat pubescent, calyx minutely pubescent, corolla  $\frac{1}{4}$ – $\frac{1}{3}$  in.

E. NEPAL; Tambur River, alt. 4000 ft., *J. D. H.* SIKKIM, alt. 3–4000 ft.; Dikeeling, *Clarke*.

*Stems* 1 foot, diffuse, weak, branched, pubescent. *Leaves*  $1\frac{1}{2}$  by  $\frac{2}{3}$ –1 in., cuneate at both ends; petiole  $\frac{1}{2}$  in. *Spikes* 1 in.; peduncles  $\frac{1}{2}$ –1 in.; bracts  $\frac{1}{4}$  by  $\frac{1}{6}$  in., scarious-margined; bracteoles  $\frac{1}{3}$  in., linear. *Calyx*  $\frac{1}{6}$  in., segments sublinear. *Anther-cells* superposed, lower muticous or whitened at base. *Ovary* nearly glabrous; style thinly hairy at base. *Capsule* less than  $\frac{1}{6}$  in., minutely pubescent; young shortly glandular-verrucose. *Seeds* small, minutely verrucose, appearing punctate.—Differs from *R. repens* in the longer-petioled broader leaves and much smaller capsule and seeds; from *R. apiculata* in the longer petioled leaves, glabrous ovary, and slender peduncles (perhaps hardly sufficiently).

10. ***R. linifolia***, *Nees in Wall. Pl. As. Rar.* iii. 110, and in *DC. Prodr.* xi. 469; leaves short-petioled elliptic acute nearly glabrous, spikes peduncled slender 4-farious secund, bracts lanceolate acute, corolla  $\frac{1}{4}$  in. *T. Anders. in Journ. Linn. Soc.* ix. 517. *Justicia linifolia*, *Wall. Cat.* 2447. *J. gracilis*, *T. Anders. l. c.* 512. *Rostellularia gracilis*, *Wight Ic.* t. 1541.

W. DECCAN PENINSULA, from the Concan southwards, *Heyne, Wight, &c.*

*Stems* 6–12 in., slender, minutely pubescent. *Leaves* 1 by  $\frac{1}{4}$ – $\frac{1}{3}$  in., from ovate to narrow-lanceolate, often apiculate, base cuneate or almost rounded, minutely scabrid or glabrous, lineolate on both surfaces; petiole usually less than  $\frac{1}{16}$  in. *Spikes* 1 by  $\frac{1}{4}$  in.; peduncles 0–1 in., slender; bracts  $\frac{1}{3}$ – $\frac{1}{6}$  in., minutely pubescent, green or narrowly scarious-margined, obscurely striate; bracteoles  $\frac{1}{3}$  in., linear-lanceolate. *Calyx*  $\frac{1}{4}$  in.; segments sublinear, pubescent. One *anther-cell* lower than the other, acute hardly tailed at the base. *Ovary* pubescent, style glabrous except close to the base. *Capsule* not seen.

11. ***R. apiculata***, *Bedd. Ic. Pl. Ind. Or.* t. 247; leaves petioled ovate or linear-oblong puberulous on the nerves beneath, spikes peduncled quadrifarious secund, bracts ovate-lanceolate apiculate minutely pubescent, calyx pubescent, corolla  $\frac{1}{4}$ – $\frac{1}{3}$  in. *R. repens*, var., *T. Anders. in Thwaites Enum.* 235, in *Obs.*—*Rungia* sp. n. 8, *Herb. Ind. Or. H. f. & T.*

MTS. of S. DECCAN; Tinnevely Hills, alt. 4000 ft., *Beddome*. CEYLON; *Thwaites*, *C. P.* n. 1973.

*Stems* 6–15 in., diffuse, branched, rooting, minutely pubescent. *Leaves*  $2\frac{1}{2}$  by



$\frac{3}{4}$ –1 in., cuneate at both ends; petiole  $\frac{1}{6}$  in.; leaves very variable, on one branch are seen ovate upper leaves and below them a leaf  $1\frac{1}{4}$  by  $\frac{1}{6}$  in. *Spikes*  $1\frac{1}{2}$  in.; peduncles  $\frac{1}{4}$ –1 in.; bracts  $\frac{1}{4}$  in., narrowly scarious-margined, finely striate; bracteoles  $\frac{1}{2}$  in., sublinear. *Calyx*  $\frac{1}{8}$ – $\frac{1}{6}$  in., segments sublinear. *Anther-cells* superposed, muticous. *Ovary* hairy, style-base glabrous; young capsule densely hairy. *Capsule*  $\frac{1}{2}$  in., pubescent; seeds small, verrucose.

*VAR. compta*; leaves small short-petioled lanceolate.—S. Travancore; *Beddome*.—*Leaves* 1 by  $\frac{1}{2}$  in.; petiole  $\frac{1}{10}$  in.; spikes in flower, capsule not seen.

12. ***R. repens***, *Nees in Wall. Pl. As. Rar.* iii. 110, and in *DC. Prodr.* xi. 472; leaves subsessile oblong-lanceolate scabrid-puberulous, bracts round apiculate nearly glabrous, corolla  $\frac{1}{4}$  in., seeds  $\frac{1}{16}$  in. diam. concentrically rugose. *Wight Ic.* t. 465; *Dalz. & Gibs. Bomb. Fl.* 196; *T. Anders. in Journ. Linn. Soc.* ix. 518. *Justicia repens*, *Linn.*; *Roxb. Corom. Pl.* ii. 29, t. 152, and *Fl. Ind.* i. 132; *Wall. Cat.* 2459. *Dicliptera repens*, *Roem. & Sch. Syst.* i. 171.—*Burm. Thes. Zeyl.* t. 3, fig. 2.

Throughout INDIA, from the Punjab and Bengal to CEYLON; common. (No specimens from the Malay Peninsula.)

A procumbent, rooting, ramous weed; branches quadrangular, pubescent or nearly glabrous. *Leaves* 2 by  $\frac{2}{3}$  in., or often smaller narrower; petiole rarely so much as  $\frac{1}{8}$  in. *Spikes* 2 by  $\frac{1}{3}$  in., appearing often peduncled, the 2 leaves close to their base usually much reduced; bracts closely regularly imbricated 4-farious, spike less 1-sided than in most species; bracts  $\frac{1}{4}$  by  $\frac{1}{6}$ – $\frac{1}{4}$  in., white margin broad prominent; bracteoles  $\frac{1}{2}$  in., linear-lanceolate, minutely pubescent. *Calyx*  $\frac{1}{6}$  in.; segments linear-lanceolate, pubescent. *Corolla* white, with rose or purple spots. *Anther-cells* superposed, lower white-tailed. *Ovary* glabrous, style thinly hairy at base. *Capsule*  $\frac{1}{4}$  in. and upwards, minutely thinly hairy. *Seeds* ovoid, moderately compressed, rugose almost furrowed.

13. ***R. elegans***, *Dalz. & Gibs. Bomb. Fl.* 196; stems patently white-hirsute, leaves subsessile ovate acuminate, bracts round ovate apiculate minutely hairy, corolla  $\frac{1}{2}$  in. fine blue. *R. repens* *var. villosa*, *Nees in DC. Prodr.* xi. 472. *Justicia repens*, *Wall. Cat.* 2459, *letter B partly*.

W. DECCAN PENINSULA; Concan and Canara, *Wight, Law, Stocks, &c.*

Possibly a large form of *R. repens*. *Leaves* attaining 3 by  $1\frac{1}{2}$  in., nerves beneath prominent, often patently white-hairy. *Spikes*  $\frac{1}{2}$ – $\frac{2}{3}$  in. broad; bracts large, scarious margin very prominent sometimes coloured purplish. *Capsule*  $\frac{1}{4}$  in., thin, very hairy; seeds concentrically furrowed, the ridges very sharp sometimes crested.

14. ***R. Beddomei***, *Clarke*; leaves nearly sessile ovate acute subglabrous, spikes slenderly peduncled dense, bracts broadly ovate apiculate nearly glabrous, corolla  $\frac{1}{4}$  in.

TENASSERIM; Mooleyit and the Forest Ranges, *Beddome*.

*Stems* diffuse, branched, puberulous. *Leaves* 2 by  $\frac{3}{4}$ –1 in., obscurely or not lineolate; petiole  $\frac{1}{8}$  in. *Spikes*  $1\frac{1}{2}$  by  $\frac{1}{2}$  in., appearing to form lax terminal corymbs; uppermost leaves  $\frac{1}{4}$  by  $\frac{1}{20}$  in.; bracts nearly as of *R. repens*, more densely imbricated, 4-farious, regular. *Capsule*  $\frac{1}{2}$  in. *Seeds* very small, minutely verrucose.—The spikes bear considerable resemblance to *R. repens*; but it seems more nearly allied to *R. himalayensis*, which differs in its long-petioled leaves, and slenderer spikes.

15. ***R. Brandisii***, *Clarke*; leaves ovate or ovate-lanceolate acuminate at both ends nearly glabrous, bracts all fertile ovate acuminate nearly glabrous, bracteoles boat-shaped acuminate pubescent, corolla  $\frac{1}{4}$  in.

TENASSERIM; *Parish, Brandis, Beddome*.

*Stems* 18 in., nearly glabrous. *Leaves*  $3\frac{1}{2}$  by  $\frac{3}{4}$ – $1\frac{1}{2}$  in., membranous, finely lineolate; petiole 1 in. *Spikes*  $1\frac{1}{2}$  by  $\frac{1}{2}$  in., terminal and axillary clustered short-peduncled; bracts  $\frac{1}{4}$  by  $\frac{1}{8}$  in., obscurely 4-ranked, very narrowly marginate; bracteoles  $\frac{1}{8}$  in.



*Calyx*  $\frac{1}{8}$  in.; segments linear-lanceolate, pubescent. *Anther-cells* superposed, lower white-tailed. *Capsule*  $\frac{1}{5}$  in., puberulous. *Seeds* small, minutely verrucose.

16. ***R. parviflora***, *Nees in Wall. Pl. As. Rar.* iii. 110, and in *DC. Prodr.* xi. 469, *excl. syn.*; leaves small ovate or lanceolate nearly glabrous, bracts dimorphic barren elliptic or oblong subobtuse striate hardly margined, fertile obovate glabrous scarious-margined ciliate, bracteoles elliptic scarcely acute, corolla  $\frac{1}{4}$  in. *R. repens*, *T. Anders. in Journ. Linn. Soc.* ix. 518 *partly, not of Nees*. *R. longifolia*, *Bedd. Ic. Pl. Ind. Or.* t. 266, *not of Nees*.

S. DECCAN PENINSULA; *Wight* (2011, 2285 *Herb. Propr.*). CEYLON; *Thwaites* (C. P., nn. 257, 3354).

A small, ramous weed. Lower leaves 1 by  $\frac{1}{4}$ – $\frac{1}{2}$  in., petioled, ovate, upper narrow sometimes linear. *Spikes*  $\frac{3}{4}$  by  $\frac{1}{4}$  in., nearly all terminal, markedly 1-sided; barren bracts not cuspidate. *Capsule*  $\frac{1}{5}$  in.; seeds small, minutely verrucose.—This, the typical *R. parviflora*, *Nees*, appears a very rare plant; *Nees*, however, referred numerous specimens with the fertile bracts hairy all over to *R. parviflora*, but which are *R. pectinata*, *Nees*, as far as the description goes.

**VAR. *pectinata***; flowerless bracts mucronate often cuspidate flowering hairy. *R. pectinata*, *Nees in DC. Prodr.* xi. 470; *Wight Ic.* t. 1547; *T. Anders. in Journ. Linn. Soc.* ix. 517. *R. parviflora*, *Nees l. c. partly*; *Griff. Notul.* iv. 144; *Dalz. & Gibs. Bomb. Fl.* 195. *R. polygonoides*, *Nees in Wall. Pl. As. Rar.* iii. 110, and *Cat.* 7181, and in *DC. Prodr.* xi. 471; *Dalz. & Gibs. Bomb. Fl.* 196. *Justicia pectinata*, *Linn. Amœn. Acad.* iv. 299; *Lamk. Ill.* i. t. 12, fig. 3; *Roxb. Corom. Pl.* ii. 29, t. 153, and *Fl. Ind.* i. 133; *Wall. Cat.* 2458. *J. parviflora*, *Retz Obs.* v. 9. *J. infracta*, *Vahl Enum.* i. 155.—Throughout India, from the Himalaya to Ceylon and Pegu, a universal weed.—Usually ramous. Leaves  $\frac{3}{4}$  by  $\frac{1}{3}$  in.; petiole  $\frac{1}{8}$  in. *Spikes* 1 by  $\frac{1}{4}$  in., terminal and axillary, clustered, subsessile, distinctly 1-sided; barren bracts  $\frac{1}{6}$  by  $\frac{1}{12}$  in., scarcely margined; fertile  $\frac{1}{10}$  in. diam., orbicular, apiculate, scarious-marginate, hairy on back as well as on margins; bracteoles  $\frac{1}{10}$  in., elliptic, subacute. *Calyx*  $\frac{1}{12}$  in.; segments linear-lanceolate, pubescent. *Corolla* blue or whiteish, upper lip short. *Anther-cells* superposed, lower white-tailed.—The area of this abundant plant should perhaps be extended to Java, &c., but the examples thence (*Dicliptera cœrulea*, *Blume Bijl.* 791) differ considerably from all the Indian material, which is very uniform in character, the size of the heads and bracts varying a little.

**VAR. *muralis***; spikes very dense, barren bracts ovate acute hardly longer than the fertile. *R. muralis*, *Nees in DC. Prodr.* xi. 470.—S. Deccan Peninsula; *Hohenacker*, n. 18, &c. Chittagong; *J. D. H.*, &c. *Distrib. Ava.*—Spikes sometimes  $1\frac{3}{4}$  by  $\frac{1}{6}$  in., densely strobiliform.

**VAR. *organoides***; leaves narrowly lanceolate, spikes dense narrow, barren bracts orbicular scarious-margined very hairy on the back nearly as the fertile. *R. organoides*, *Nees in Wall. Pl. As. Rar.* iii. 110, and *Cat.* 7182, and in *DC. Prodr.* xi. 471.—Pegu; *Wallich*.

#### SPECIES NOT SEEN.

**R. MASTERSI**, *T. Anders. in Journ. Linn. Soc.* ix. 519; glabrous, leaves long-petioled ovate, spikes terminal ternate or paniced lax, bracts remote alternate spathulate-linear obtuse, corolla small.

ASSAM; banks of R. Soonder, *Masters*.

Herbaceous, larger than the other species of the genus. Leaves (including petiole) 5–8 by  $1\frac{1}{2}$ –2 in., minutely lineolate, pale beneath. *Spikes* 3–6 in., more or less secund, glabrous or pubescent; bracts  $\frac{1}{8}$  by  $\frac{1}{24}$  in., mostly linear, obtuse, glabrous; bracteoles as the bracts or ovate acute glumaceous. *Corolla*  $\frac{1}{3}$  in., glabrous. *Capsule*  $\frac{1}{4}$  in., sparsely puberulous or pubescent (T. Anderson).

### XLVII. **DICLIPTERA**, *Juss.*

Diffuse herbs. Leaves ovate, acute, entire or obscurely undulate. Inflorescence cymose, clustered or paniced; proper bracts opposite, unequal,



larger than the calyx (except in *D. parvibracteata*); flowers sessile, opposite, one of each pair usually reduced to a rudimentary calyx and bracteoles; bracteoles linear or linear-lanceolate, as long as the calyx (except in *D. parvibracteata*). *Calyx* sub-5-partite; segments equal, linear-lanceolate, more or less pubescent. *Corolla* red or rose, purple-spotted, tube slender, limb deeply 2-lipped; upper lip entire or emarginate, lower 3-lobed recurved. *Stamens* 2; anthers 2-celled; cells ovoid, superposed, muticous. *Ovary* 4-ovulate; style filiform, shortly bifid. *Capsule* clavate, stalk solid; placentae rising elastically from their base. *Seeds* ovoid, compressed, glabrous, verrucose or glandular subpapillose.—Species 60, tropics of both Hemispheres.

*Justicia chinensis*, Vahl, *Roxb. Fl. Ind.* i. 124, Wall. *Cat.* 2466 (type sheet), has been long cultivated at Calcutta, having been introduced from China or Malaya; it looks like an enlarged or garden form of *D. Burmanni*, noticed below under *D. Leonotis*, Dalz.

\* *Inflorescence panicked*, i. e. each pair of bracts mostly long-petioled.

1. ***D. parvibracteata***, Nees in Wall. *Pl. As. Rar.* iii. 111, and in DC. *Prodr.* xi. 488; leaves ovate acuminate nearly glabrous, bracts  $\frac{1}{10}$  in. linear. *Justicia retorta*, Vahl *Enum.* i. 150 ? *J. latebrosa*, Koen.; *Roxb. Fl. Ind.* i. 125.

MADRAS; Circars, Wight (Herb. Propr. n. 51 or 2014); Vizagapatam (Jaipoor Hills), Beddome.

*Stem* diffuse, striate, obscurely pubescent upwards. *Leaves* 5 by  $2\frac{3}{4}$  in. (or all except the lowest small, 1–2 in.), base shortly acuminate; petiole 1 in. *Panicle* 6 in., divaricate, lax, nearly glabrous; floral leaves at the bifurcations  $\frac{1}{10}$ – $\frac{1}{4}$  in., linear-lanceolate; bracteoles  $\frac{1}{16}$  in., linear. *Calyx*  $\frac{1}{16}$  in., sub-5-partite; segments linear-lanceolate, minutely pubescent. *Corolla*  $\frac{1}{2}$  in., slender, minutely pubescent. *Capsule*  $\frac{1}{4}$  in., clavate, pubescent; placentae rising elastically.—*Justicia latebrosa*, Koen., has never been satisfactorily recovered. The Ic. Ined. of this at Kew is *D. parvibracteata*; a separate imperfect drawing of a capsule added in the corner perhaps not pertaining. But Roxburgh's description does not suit in several points, of which "Flowers large" is difficult to get over. A scrap in Wallich's Herbarium, marked in old handwriting "*Justicia latebrosa*, Roxb.," is *Dicliptera cuneata*.

2. ***D. Beddomei***, Clarke; leaves ovate acuminate minutely pubescent, bracts  $\frac{1}{3}$  in. linear-oblong suddenly mucronate ciliate.

N. MADRAS; Nallaymallays (in Kurnool), Beddome.

*Stems* diffuse, striate, glabrous except the tips. *Leaves*  $5\frac{1}{2}$  by  $3\frac{1}{4}$  in., pubescent beneath or nearly glabrous, base acuminate; petiole 2 in. *Panicle* 6 in., lax branches often patently white-hairy; floral leaves at the bifurcations gradually reduced, uppermost linear; bracteoles  $\frac{1}{8}$  in., linear-lanceolate. *Corolla*  $\frac{3}{4}$  in., minutely pubescent. *Capsule* nearly  $\frac{1}{3}$  in., clavate, pubescent; placentae rising elastically from the base. *Seeds* verrucose.

3. ***D. Kurzii***, Clarke; patently white-hairy, leaves lanceolate, bracts  $\frac{1}{2}$  in. linear-lanceolate hirsute glandular-hairy. *D. speciosa*, Var.  $\beta$  only, Kurz in *Journ. As. Soc.* 1873, pt. ii. 97.

PEGU; Kurz.

*Stem* stout, striate, patently white-hairy. *Leaves* 5 by  $1\frac{1}{2}$  in., acuminate at both ends, thinly hairy on both surfaces; petiole  $\frac{1}{4}$  in. *Panicle* 6–15 in., divaricate, lax, patently white-hairy; bracts and bracteoles with glandular hammer-headed hairs, and also white-hirsute. *Corolla*  $\frac{1}{2}$ – $\frac{2}{3}$  in., slender, minutely hairy. *Capsule*  $\frac{1}{3}$  in., clavate, pubescent, placentae rising elastically. *Seeds* verrucose.—Placed doubtfully as a var. of *D. speciosa* by Kurz; the inflorescence is different, and the corolla is considerably smaller.



4. **D. speciosa**, Kurz in Journ. As. Soc. 1873, pt. ii. *Var. a* only; leaves large lanceolate thinly hairy on both surfaces, bracts  $\frac{1}{3}$ – $\frac{1}{2}$  in. spathulate-oblong obtuse hirsute glandular-hairy.

PEGU; Kurz.

*Stem* terete, glabrous, except towards the top. *Leaves* 8 by  $2\frac{1}{2}$  in., acuminate at both ends; petiole  $1\frac{1}{2}$  in. *Cymes* 1– $1\frac{1}{2}$  in., axillary, often several together, sometimes from the lower axils; mostly subsimply umbelled, rarely compound; floral leaves  $\frac{1}{3}$  in., linear; proper bracts  $\frac{1}{8}$  in. broad, on cinereous-pubescent peduncles  $\frac{1}{3}$  in. long. *Corolla* nearly 1 in., lower lip broad. *Capsule* (immature) clavate, minutely glandulose-pubescent, 4-seeded.

5. **D. zeylanica**, Nees in DC. Prodr. xi. 474; leaves ovate acuminate minutely scabrid or glabrate, bracts ovate or elliptic mucronate glabrous or minutely pubescent. *D. bivalvis*, Nees l. c. 475 (as to the Indian material); Dalz. & Gibs. Bomb. Fl. 196; Wight Ill. t. 164 b, fig. 10, and Ic. t. 1551; T. Anders. Thwaites Enum. 235, and in Journ. Linn. Soc. ix. 519, not of Juss.

W. DECCAN PENINSULA from the Concan southward, and CEYLON; frequent.

*Stem* glabrous, sometimes pubescent or densely woolly. *Leaves* attaining 5 by  $2\frac{1}{2}$  in., base shortly acuminate; petiole  $\frac{2}{3}$  in. *Inflorescence* variable; in the type of Wight running into terminal panicles, upper floral leaves linear, peduncles  $\frac{1}{4}$ –1 in.; more often cymes axillary, abbreviated, peduncles ternate; or peduncles subobsolete, or the inflorescence reduced to one pair of bracts; bracts  $\frac{1}{2}$  in. broad in the type specimen, often only  $\frac{1}{4}$  in. broad, never acuminate, either cuneate or subobtuse mucronate, frequently nervose; bracteoles small, linear-lanceolate. *Corolla*  $\frac{1}{2}$  in. *Capsule*  $\frac{1}{4}$ – $\frac{1}{3}$  in., clavate, pubescent. *Seeds* minutely verrucose.—*Dicliptera bivalvis*, Juss., is exactly *Justicia bivalvis*, Linn.; which, in so far as it relates to any Indian plant, is founded on Rheed. Hort. Mal. ix. t. 43, which cannot represent the present plant (and may be *Peristrophe montana*). *D. bivalvis*, Juss., can, therefore, not even *partim* be the present *D. zeylanica*.

\*\* *Inflorescence clustered subcapitate*, i. e. each pair of bracts, subsessile or very shortly petioled (see also 5, *D. zeylanica*).

6. **D. cuneata**, Nees in Wall. Pl. As. Rar. iii. 111, and in DC. Prodr. xi. 481; leaves ovate acuminate glabrous, flower-clusters often long-peduncled, bracts obovate elliptic or cuneate apiculate or mucronate nearly glabrous. Wight Ic. t. 1552; T. Anders. in Journ. Linn. Soc. ix. 521. *Justicia umbellata*, Wall. Cat. 2467.

S. MADRAS; Wight, &c.; Tinnevely, Beddome.

Pairs of bracts on short peduncles 0– $\frac{1}{8}$  in., often 3–8 together forming a subcapitate cluster; these clusters often on a peduncle  $\frac{1}{2}$ – $1\frac{1}{2}$  in., floral leaves supporting the cluster usually reduced, narrow.—Otherwise very near the glabrous forms of *D. zeylanica* with congested inflorescence: both T. Anderson and Beddome have, however, treated the species as distinct.

7. **D. reptans**, Nees in DC. Prodr. xi. 483; leaves elliptic acuminate puberulous beneath, flower-clusters axillary subsessile, bracts elliptic acute mucronate softly pubescent.

MERGUI; Griffith.

*Stems* procumbent, rooting; branches 6–10 in., erect, puberulous. *Leaves* 3 by 1 in., base shortly acuminate; petiole  $\frac{1}{4}$  in. *Peduncles* to the flower-clusters 0– $\frac{1}{8}$  in.; floral leaves  $\frac{1}{8}$  in., linear; peduncles to the pairs of bracts 0– $\frac{1}{8}$  in., minutely pubescent; bracts nearly  $\frac{1}{2}$  by  $\frac{1}{3}$  in., 1-nerved; secondary nerves oblique, subprominent. *Corolla*  $\frac{1}{2}$  in., slender.—*Capsule* not seen; and anther-cells rather long for a *Dicliptera*; it is possibly a *Peristrophe* (as Griffith marked it in the field), and greatly resembles *P. acuminata* var. *fragilis*, except that the flower is smaller.



8. **D. micranthes**, *Nees in Wall. Pl. As. Rar.* iii. 112, and in *DC. Prodr.* xi. 484, *excl. syn.*; leaves ovate acuminate nearly glabrous, flower-clusters mostly in axillary whorls, bracts oblong somewhat obovate cuspidate ciliate. *Dalz. & Gibs. Bomb. Fl.* 197; *T. Anders. in Journ. Linn. Soc.* ix. 521.

CENTRAL INDIA, alt. 1–3000 ft.; from Behar (*J. D. H.*) and Chota Nagpore to the Concan, frequent.—DISTRIB. Abyssinia.

*Branches* striate, puberulous or glabrate. *Leaves* 4 by  $1\frac{1}{2}$  in., base shortly acuminate; petiole  $1\frac{1}{2}$  in. *Bracts*  $\frac{1}{3}$  by  $\frac{1}{12}$  in., often nearly glabrous except the densely white ciliate margins. *Corolla* scarcely exceeding  $\frac{1}{4}$  in., very slender. *Capsule*  $\frac{1}{8}$  in., clavate, very shortly stalked, membranous, glabrous except the minutely hairy tip. *Seeds* very small, conspicuously verrucose.

9. **D. Leonotis**, *Dalz. ms.*; leaves elliptic acuminate glabrous, flower-clusters mostly in axillary whorls, bracts oblong-lanceolate acuminate cuspidate minutely pubescent. *D. Burmanni*, *Nees in Wall. Pl. As. Rar.* iii. 112, and in *DC. Prodr.* xi. 483 *partly, not of T. Anders.*; *Dalz. & Gibs. Bomb. Fl.* 196?. *Justicia chinensis*, *Wall. Cat.* 2466, *letter c partly*.

DECCAN PENINSULA?; *Wight* (*Herb. Propr.* n. 2016). GOOJERAT and AJMERE, *Dalzell*.

Closely allied to *D. micranthes*, but the bracts, flowers, capsules and seeds considerably larger. *Leaves* 3 by 1 in.; petiole  $\frac{1}{3}$  in. *Bracts*  $\frac{1}{2}$  by  $\frac{1}{8}$  in., much acuminate. *Corolla*  $\frac{2}{3}$  in. *Capsule*  $\frac{1}{4}$  in., very hairy. *Seeds* much larger than in *D. micranthes*, minutely glandulose-papillose, scarcely verrucose.—Nees grounds his *D. Burmanni* on Burmann's figure of a Java species; this is *D. Burmanni*, *T. Anders. in Journ. Linn. Soc.* ix. 520. In founding the species, Nees states he had only seen one specimen, viz. *Wight* n. 2016, which sheet named by Nees' hand is at Kew; but it is not the plant figured by Burmann.

10. **D. riparia**, *Nees in Wall. Pl. As. Rar.* iii. 112, and *Cat.* 7183, and in *DC. Prodr.* xi. 480; leaves ovate acuminate glabrous or pubescent, flower-clusters terminal and axillary subverticillate, bracts narrowly obovate obtuse hairy ciliate, corolla  $\frac{2}{3}$  in. *T. Anders. in Journ. Linn. Soc.* ix. 520.

PEGU and TENASSERIM; *Wallich, Griffith, M'Lelland, &c.*

*Branches* elongate. *Leaves*  $4\frac{1}{2}$  by  $1\frac{1}{2}$ – $2\frac{1}{2}$  in., base shortly acuminate; petiole  $1\frac{1}{2}$  in. *Flowers* subsessile; bracts unequal, similar, larger  $\frac{1}{3}$  by  $\frac{1}{6}$  in.; bracteoles  $\frac{1}{4}$  in., linear. *Calyx*  $\frac{1}{3}$  in.; segments linear, nearly glabrous. *Capsule*  $\frac{1}{4}$  in., clavate, nearly glabrous. *Seeds* minutely papillose, hardly verrucose.—Perhaps only a form of *D. Roxburghiana*, differing in the softly pubescent flower-clusters, and the very obtuse often emarginate bracts. The numerous examples are exactly alike, but come from one neighbourhood.

11. **D. Roxburghiana**, *Nees in Wall. Pl. As. Rar.* iii. 111, and in *DC. Prodr.* xi. 483, *excl. syn.*; leaves elliptic acute obscurely pubescent or glabrate, flower-clusters axillary and terminal sessile more rarely shortly peduncled, bracts cuneate-elliptic or obovate apiculate not acuminate. *T. Anders. in Journ. Linn. Soc.* ix. 519, *partly*; *Dalz. & Gibs. Bomb. Fl.* 196?. *Justicia chinensis*, *Wall. Cat.* 2466, *letter D*, and *part B, C*.

Plains of N. INDIA, from the Punjab to Assam, Silhet and E. Bengal, frequent. BHOTAN; *Griffith*.

*Stems* 1–3 ft., elongate, nearly glabrous. *Leaves*  $2\frac{1}{2}$  by 1 in., base cuneate; petiole  $\frac{1}{4}$  in. *Bracts* nearly  $\frac{1}{2}$  by  $\frac{1}{8}$  in., often 3-nerved, ciliate, thinly pubescent. *Corolla*  $\frac{3}{4}$  in. *Capsule*  $\frac{1}{4}$  in., clavate, puberulous or glabrous. *Seeds* conspicuously verrucose.—The whole of the plains form of *D. Roxburghiana* differs from Var.



*bupleuroides* in the broader, more or less obovate, bracts. Nees founded his species on the common Assam and E. Bengal plant, and the original ticket on his type specimen is marked Assam. Benthams, however (in Fl. Hongk. 266), says this was an error, and that this type specimen came from the Calcutta Botanic Garden; but it is not known how Benthams discovered this. Nees, however, is in error in citing Roxburgh's *Justicia chinensis*, for Roxburgh's Ic. Ined. proves this to have been the true plant, long cultivated at Calcutta.

VAR. *bupleuroides*, Nees in Wall. Pl. As. Rar. iii. 111, and in DC. Prodr. xi. 485, excl. syn. Roxb. (sp.); leaves ovate or elliptic acute or acuminate glabrous or somewhat pubescent, flower-clusters dense axillary and terminal mostly sessile, bracts linear or linear-oblong nearly parallel-sided acuminate cuspidate. *D. cardiocarpa*, Nees in Wall. Pl. As. Rar. iii. 111, and in DC. Prodr. xi. 480. *D. hirtula*, Nees in DC. Prodr. xi. 485. *D. Roxburghii*, T. Anders. in Journ. Linn. Soc. ix. 519, chiefly. *D. Roxburghiana*, Boiss. Fl. Orient. iv. 526, not of Nees. *D. rupestris*, Nees in DC. Prodr. xi. 486. *D. crinita*, Nees l. c. 485, as to the Indian examples so named by Nees. *Justicia chinensis*, Wall. Cat. 2466, letter B, C partly; Roxb. Fl. Ind. i. 125, Obs. only. *J. canescens*, Wall. Cat. 2423.—Throughout India in the hills, alt. 1–6000 ft., abundant in the north, becoming rare in the Malabar Ghauts; in the Himalaya from Kashmir to Upper Assam and the Chittagong Hills; Mt. Aboo, Stocks; Central India. Distrib. Affghanistan.—A large very uniform series, varying only slightly in the pubescence of the bracts. In the extreme forms the bracts are  $\frac{3}{4}$  by  $\frac{1}{16}$  in., glistening ciliate, and in some of Beddome's Malabar specimens they are almost subulate. Though the bracts are often broader than in these, the plant as a whole is tolerably well separable from *D. Roxburghiana*.

#### XLVIII. **PERISTROPHE**, Nees.

Erect, spreading herbs. *Leaves* entire. *Flower-clusters* axillary or terminal, often paniced by the reduction of the floral leaves; bracts 1–4 together, linear or ovate, longer (rarely shorter) than the calyx; bracteoles linear-lanceolate, shorter than the bracts. *Calyx* deeply 5-lobed; segments equal, linear-lanceolate. *Corolla* rose or purple; tube slender, limb deeply 2-lipped, upper lip subentire, lower very shortly 3-lobed. *Stamens* 2; filaments pubescent below; anthers 2-celled, cells linear (or in *P. bicalyculata* ovoid), muticous, one higher than the other or distant. *Ovary* 4-ovulate; style filiform, minutely bifid. *Capsule* ellipsoid, stalked, usually 4-seeded, more or less dusky pubescent. *Seeds* ovoid, compressed, glabrous, minutely glandular-papillose, scarcely verrucose.—Species 15, from Tropical and S. Africa to New Caledonia and S. Japan.

1. ***P. bicalyculata***, Nees in Wall. Pl. As. Rar. iii. 113, and in DC. Prodr. xi. 496; thinly patent hairy, leaves ovate acuminate, panicle lax divaricate, bracts linear or linear-spathulate acute mucronate, corolla  $\frac{1}{3}$ – $\frac{1}{2}$  in. Dalz. & Gibs. Bomb. Fl. 197; T. Anders. in Journ. Linn. Soc. ix. 521. *P. Kotschyana*, Nees l. c. 197. *Justicia bicalyculata*, Vahl Symb. ii. 13; Roxb. Fl. Ind. i. 126; Blume Bijdr. 783; Wall. Cat. 2457. *J. ligulata*, Lamk. Ill. t. 12, fig. 2; Cav. Ic. t. i. 52, t. 71. *Dianthera malabarica*, Linn. f. Suppl. 85. *D. bicalyculata*, Retz in Act. Holm. 1775, 297, t. 9, and Obs. i. 10. *Ruellia paniculata*, Linn. Herb.

TROPICAL and SUBTROPICAL INDIA; from the Punjab and Scinde to Assam, Pegu and Madras, very common; not known from Ceylon.—DISTRIB. Tropical Africa.

*Leaves* 2 by 1 in.; petiole  $\frac{1}{4}$  in. Each pair of proper bracts long-petioled; bracts  $\frac{1}{3}$  by  $\frac{1}{20}$  in., unequal. *Anther-cells* ovoid, remote, resembling those of *Dicliptera*, not of other *Peristrophes*. *Capsule*  $\frac{1}{3}$ – $\frac{1}{2}$  in. *Seeds* minutely glandular-papillose.



VAR. *rivinioides*; young inflorescence axillary very short-peduncled capitellate. *P. rivinioides*, Wall. Cat. 2488. *P. bicalyculata*, Var.  $\beta$ , Nees ms. in Wight Herb. Propr. n. 2018 c.—S. India.

2. ***P. undulata***, Nees in DC. Prodr. xi. 496; puberulous, leaves lanceolate undulate, panicles small close, bracts linear-lanceolate, corolla  $\frac{3}{4}$  in. *Justicia undulata*, Vahl Symb. ii. 8, excl. syn.

MALABAR (Koenig, fide Vahl). NILGIRIS; Beddome.

Leaves  $2\frac{3}{4}$  by  $\frac{2}{3}$  in., attenuate at both ends, sinuate, in Beddome's examples variegated; petiole  $\frac{1}{3}$  in. Panicle 1–2 in. diam., terminal, hardly exceeding the upper leaves; bracts  $\frac{1}{2}$ – $\frac{3}{4}$  by  $\frac{1}{12}$  in., 2 or 3–4 together, 2–4-fld., lineolate, nearly glabrous. Corolla purple-red, tube  $\frac{1}{3}$  in., limb  $\frac{1}{3}$  in., lobes 2 very shortly toothed. Anther-cells linear, one placed close above the other. Capsule not seen.—This appears closely allied to *P. acuminata*, as Nees states.

3. ***P. acuminata***, Nees in Wall. Pl. As. Rar. iii. 113, and in DC. Prodr. xi. 496; leaves narrowly lanceolate nearly glabrous, panicles compact, bracts  $\frac{1}{2}$  by  $\frac{1}{16}$  in. glabrous, corolla  $\frac{3}{4}$  in. T. Anders. in Journ. Linn. Soc. ix. 521. *P. Blumeana*, Nees l. c. 495. *Justicia acuminata*, Wall. Cat. 2425, sheet B partly.

TAVOY; Wallich. MALACCA; Griffith.—DISTRIB. Java.

Leaves 3 by  $\frac{2}{3}$  in., acuminate at both ends, lineate on both surfaces, minutely pubescent on the midrib beneath or glabrous; petiole  $\frac{1}{4}$  in. Bracts 2–4 together,  $\frac{1}{2}$  in. long or in other cymes of the same branch scarcely  $\frac{1}{8}$  in. Anther-cells linear, one slightly overlapping the other, upper usually narrower curved. Capsule  $\frac{1}{3}$ – $\frac{1}{2}$  in., nearly glabrous.—The plants here collected under *P. acuminata* are separated from *P. montana* by the much smaller corolla, and possibly include 2 or more species; but the material is insufficient. As noted by Nees, some of the specimens show great variation in the bracts on one branchlet; yet species have been founded on characters almost wholly drawn from them. In justification of throwing the species into one, it may be observed that the Malacca plant marked *P. acuminata* by T. Anderson is identical with the Java plant marked *P. Blumeana* by Nees; but there is no specimen from Burma (much less from Khasia) that matches this, as might be inferred from Nees and T. Anderson: and Miquel's *P. acuminata* from Java is very unlike *P. acuminata*, Nees.

VAR. *fragilis*; leaves larger ovate-lanceolate, bracts  $\frac{2}{3}$  by  $\frac{1}{8}$  in. broadly lanceolate glabrous. *P. gracilis*, Nees in Wall. Pl. As. Rar. iii. 113, and in DC. Prodr. xi. 495, and in Wall. Cat. 7184; T. Anders. in Journ. Linn. Soc. ix. 522. *Justicia acuminata*, Wall. Cat. 2425, sheet B partly.—Tavoy; Wallich. Rangoon; McLelland. Mergui; Griffith.—Leaves 5 by 2 in.; nerves many, pubescent; uppermost leaves linear-lanceolate.—The Tavoy example marked by Nees *fragilis* is identical with some of that marked by him *acuminata*.

VAR. *khasiana*, bracts all small  $\frac{1}{8}$  in. fuscous-pubescent. *Justicia acuminata*, Wall. Cat. 2425, letter A right-hand fragments.—Khasia Mts.; Wallich.—This does not look like a *Peristrophe*, but the corolla and stamens are exactly as in *P. acuminata*, type.

4. ***P. lanceolaria***, Nees in Wall. Pl. As. Rar. iii. 114, and in DC. Prodr. xi. 496; leaves lanceolate or ovate-lanceolate nearly glabrous, panicles densely glandular-pubescent, bracts  $\frac{2}{3}$  in. linear-lanceolate, corolla  $1\frac{3}{4}$  in. Bot. Mag. 5566; T. Anders. in Journ. Linn. Soc. ix. 522. *Justicia lanceolaria*, Roxb. Fl. Ind. i. 121; Wall. Cat. 2463.

SILHET and JAINTAPOOR, alt. 500 ft.; Wallich, &c., frequent. MOULMEIN; Parish. TENASSERIM; Beddome.

Leaves  $5\frac{1}{2}$  by 2 in., acute at both ends, pubescent on the nerves beneath or glabrate, obscurely or not lineolate; petiole  $\frac{3}{4}$  in. Panicles strict, branches erect. Calyx  $\frac{1}{4}$ – $\frac{1}{3}$  in.; segments sublinear. Anther-cells linear-oblong, immediately superposed.



*Capsule*  $\frac{3}{4}$  in., viscous-pubescent.—A strongly marked species; the Moulmein plant (*P. grandiflora*, Parish ms.) has the flowers hardly larger than in some examples from Silhet.

5. ***P. speciosa***, *Nees in Wall. Pl. As. Rar.* iii. 113, and in *DC. Prodr.* xi. 495; leaves ovate-lanceolate or elliptic acute nearly glabrous, floral leaves mostly large, bracts linear-oblong not acute nearly glabrous many widened upwards, corolla  $1\frac{3}{4}$  in. *T. Anders. in Journ. Linn. Soc.* ix. 521. *Justicia speciosa*, *Roxb. Fl. Ind.* i. 122; *Bot. Mag.* t. 2722; *Wall. Cat.* 2464; *Lodd. Bot. Cab.* t. 1915.

SUBTROPICAL HIMALAYA, alt. 1–5000 ft., from Kumaon to Bhotan, frequent; *Wallich, &c.* SILHET STATION; *Clarke*.

*Leaves* 5 by 2 in., base rhomboid or acute; petiole 1 in. *Floral leaves* often 1–2 in., so that the flower-clusters often appear terminal or axillary subcapitate rather than paniced; bracts  $\frac{2}{3}$  by  $\frac{1}{8}$ – $\frac{1}{6}$  in., subobtus, sometimes spathulate, tips often recurved. *Anther-cells* linear-oblong, one superposed half its length.

6. ***P. montana***, *Nees in Wall. Pl. As. Rar.* iii. 113, and in *DC. Prodr.* xi. 493, *partly*; leaves elliptic acuminate at both ends subglabrous, bracts large elliptic glabrous nervose, corolla  $2\frac{1}{4}$  in. *Wight Ic.* t. 1553; *T. Anders. in Journ. Linn. Soc.* ix. 521. *Justicia sylvestris*, *Wall. Cat.* 2468.

W. DECCAN PENINSULA from the Concan southward, and CEYLON, frequent; *Wight, &c.*

*Leaves*  $5\frac{1}{2}$  by  $1\frac{3}{4}$  in., raphides very slender on both surfaces; petiole  $1\frac{1}{4}$  in. *Bracts*  $\frac{3}{4}$  by  $\frac{1}{3}$ – $\frac{1}{2}$  in., obtuse or minutely apiculate, not acuminate. *Filaments* pubescent; *anther-cells* linear, one half its length below the other.—Described from *Wight, Herb. Propr.* n. 2017, its type (named in Nees' hand); and includes all the S. Indian examples of Nees and T. Anderson, *not* their Khasi material.

7. ***P. tinctoria***, *Nees in Wall. Pl. As. Rar.* iii. 113, and in *DC. Prodr.* xi. 493 ?; dusky-puberulous, leaves short-petioled ovate subacute not large, bracts elliptic subacute nervose not ciliate, corolla  $1\frac{1}{4}$  in. slender. *T. Anders. in Journ. Linn. Soc.* ix. 521, *partly*. *Justicia tinctoria*, *Roxb. Fl. Ind.* i. 123; *Wall. Cat.* 2465. *J. Roxburghiana*, *Roem. & Sch. Syst. Mant.* i. 140.

INDIA; cultivated frequently from Assam to CEYLON.—DISTRIB. Malaya, S.E. Asia; where wild not known.

*Leaves* 2–3 by 1– $1\frac{1}{4}$  in.; lower petioles rarely exceeding  $\frac{1}{4}$  in., dusky-puberulous. *Bracts*  $\frac{3}{4}$  by  $\frac{1}{3}$  in., somewhat nervose, dusky-puberulous. *Anther-cells* linear, one superposed for half its length. *Capsule* hardly  $\frac{1}{2}$  in., shortly stalked.—A well-marked cultivated form, described from Roxburgh's and Wallich's specimens. Nees has diagnosed his *P. tinctoria* so as expressly to exclude (by the ciliate bracts, &c.) all the examples; so that the name *P. tinctoria*, Nees, can only be understood to refer to some of Nees' synonyms. The figure of *Dianthera japonica*, *Thunb. Fl. Jap.* 21, t. 4, cited by Nees for this species, is a *Dicliptera*, and with it much of Nees' synonymy falls to the ground.

8. ***P. fera***, *Clarke*; leaves long-petioled ovate-lanceolate acuminate more or less pubescent, bracts elliptic often elongate nervose ciliate often hairy, corolla  $1\frac{3}{4}$  in. *P. montana*, Var.  $\beta$  *sylvestris*, *Nees in DC. Prodr.* xi. 493 (as to the N. Indian examples). *P. tinctoria*, *Nees l. c. as to descr. only*; *T. Anders. in Journ. Linn. Soc.* ix. 521, *chiefly*. *Justicia acuminata*, *Wall. Cat.* 2425, *left example on type sheet*.—*Peristrophe* sp., *Griff. Itin. Notes*, 36, n. 596.

EASTERN FRONTIER Bhotan, *Griffith*. ASSAM and KHASIA MTS., alt. 1–4000 ft., common, *H. f. & T., &c.*



*Leaves*  $4\frac{1}{2}$  by  $1\frac{3}{4}$  in.; raphides obscure or 0; petiole (of the middle cauline leaves) often exceeding 1 in. *Bracts*  $\frac{3}{4}$  by  $\frac{1}{4}$  in., often obtusely acuminate. *Corolla* much broader than in *P. tinctoria*.—Possibly the wild form of *P. tinctoria*. Nees, after diagnosing his *P. montana* as having non-ciliate bracts, has thus named examples of *P. fera* with intensely ciliate bracts.

VAR. *intermedia*; bracts more hairy, flowers smaller.—Chittagong, alt. 1000 ft.; H. f. & T. Pegu; Kurz. Tenasserim; Beddome.—This has been named *P. jalap-pæfolia*, Nees, but the corolla is much smaller than in the Malay examples of that species. It is suspiciously intermediate between the *P. acuminata* var. *fragilis* and *P. fera*; and both plants were collected by Beddome on the slopes of Mooleyit in Tenasserim; the corolla is the same size in both, and the only difference between them is that in Var. *intermedia* the bracts are  $\frac{1}{4}$  in. broad and hairy, but in *P. acuminata* var. *fragilis*  $\frac{1}{8}$  in. broad and glabrous.

## XLIX. HYPOESTES, R. Br.

Herbs or shrubs. *Leaves* entire or toothed. *Flower-clusters* spiked, capitellate or rarely solitary; bracts 2–4 together, free or united at base, enclosing 1–4 flowers, of which all but 1 are usually reduced or obsolete; bracteoles shorter than the bracts, narrow. *Calyx* very small (or in *H. lanata* nearly equalling the bracteoles), deeply 5-lobed, scarious or membranous; segments linear-lanceolate. *Corolla* pink purple or white (in the Indian species); tube slender, limb 2-partite; upper lip subentire, lower very shortly 3-lobed. *Stamens* 2; anthers 1-celled, muticous. *Ovary* 4-celled?; style filiform, scarcely bifid at the tip. *Capsule* ellipsoid, stalked, usually 4-seeded. *Seeds* ovoid, compressed, glabrous, in the Indian species verrucose.—Species 70, from Tropical and S. Africa, the Himalaya, China and Australia.

*Hypoestes purpurea*, R. Br., Nees in Wall. Pl. As. Rar. iii. 114 (*Justicia purpurea*, Wall. Cat. 2473), is a Malay Archipelago plant, cultivated from long ago in Bengal.

1. **H. lanata**, Dalz. in Hook. Kew Journ. ii. 343; leaves elliptic acuminate entire nearly glabrous, spikes elongate interrupted softly hairy axillary and running into large terminal panicles, bracts distinct linear, corolla 1 in. Dalz. & Gibs. Bomb. Fl. 197; T. Anders. in Journ. Linn. Soc. ix. 522.

CONCAN GHATS; Law, Dalzell.

An undershrub. *Leaves* 5 by  $1\frac{3}{4}$  in., minutely lineolate on both surfaces; petiole  $\frac{3}{4}$  in., sometimes winged. *Spikes* 6 in. and upwards; flowers mostly in opposite distant clusters, each cluster consisting of 1–3 bracts and 1 (with 1 or 2 reduced) flower: bracts  $\frac{1}{2}$ – $\frac{3}{4}$  in., very hairy. *Calyx*  $\frac{1}{2}$  in., hairy. *Capsule* nearly  $\frac{3}{4}$  in., stalked, pubescent. *Seeds* verrucose.—Habit very remote from *Hypoestes*, superficially resembling *Strobilanthes perfoliatus*, but the corolla and stamens are typical *Hypoestes*.

2. **H. triflora**, Roem. & Sch. Syst. i. 88; leaves ovate somewhat hairy on both surfaces, flower-clusters capitellate axillary and terminal, bracts narrowly obovate subobtusate, corolla scarcely  $\frac{1}{2}$  in. Nees in DC. Prodr. xi. 506; T. Anders. in Journ. Linn. Soc. ix. 522. *H. Wallichii*, Nees in Wall. Pl. As. Rar. iii. 114. *Justicia chinensis*, Wall. Cat. 2466, letter E.

NEPAL; Wallich; Tambur River, alt. 1–3000 ft., J. D. H. SIKKIM and BHOTAN, alt. 4–7000 ft., Clarke, Griffith.—DISTRIB. Abyssinia.

Herbaceous, ramous. *Leaves* attaining  $3\frac{1}{2}$  by 2 in., mostly much smaller, crenate or denticulate, sparsely hairy above, pubescent beneath; petiole  $1\frac{1}{2}$  in. *Flower-clusters* 1–5 (often 3) together, subsessile; bracts opposite, paired, flower in one of each pair nearly always 0 or much reduced; bracteoles  $\frac{1}{4}$ – $\frac{1}{2}$  in., linear-lanceolate,



nearly as long as the bracts. *Calyx*  $\frac{1}{8}$  in. *Corolla* pink or white. *Capsule*  $\frac{1}{2}$  in., nearly glabrous. *Seeds* verrucose.—The placentae tend to rise elastically, and the inflorescence also draws this plant very close to *Dicliptera*.

3. **H. malaccensis**, *Wight Ic.* t. 1555; leaves elliptic acuminate pubescent beneath, flower-clusters numerous capitate, bracts lanceolate acute connate at base, corolla  $\frac{3}{4}$  in. slender. *T. Anders. in Journ. Linn. Soc.* ix. 522. *H. Decaisneana* & *laxiflora*, *Nees in DC. Prodr.* xi. 508.

MALACCA; *Griffith, Capt. A. C. Wight, Maingay*.

*Branches* herbaceous, diffuse, minutely pubescent. *Leaves*  $2\frac{1}{2}$  by 1 in., petiole  $\frac{1}{3}$  in. *Inflorescence* dense, minutely ashy-pubescent; bracts  $\frac{1}{2}$ – $\frac{2}{3}$  in., several connate into a tube, enclosing 1–4 flowers, of which all but 1 are usually rudimentary; bracteoles  $\frac{1}{4}$  in., linear, scarious. *Calyx* scarcely  $\frac{1}{6}$  in., membranous. *Capsule* nearly  $\frac{1}{2}$  in.—This extends, with slight variation in size of corolla and degree of union of the bracts, throughout the Malay Archipelago to the Philippines.

#### ORDER CX. SELAGINEÆ. (By J. D. Hooker.)

Herbs or shrubs. *Leaves* alternate or the lower opposite, entire or toothed. *Flowers* small, solitary or spicate, irregular, 2-sexual. *Calyx* inferior, spathaceous or tubular and 2–5-fid or -partite, imbricate in bud. *Corolla* monopetalous, tube entire or split, limb 2-lipped or 4–5-lobed, imbricate in bud. *Stamens* inserted on the corolla-throat or -lobes, 2, or 4 with a rudimentary 5th, filaments filiform; anther-cells confluent. *Ovary* free, 2-celled; style simple, terminal, stigma subcapitate or 2-lobed; ovules 1 pendulous from the top of each cell, anatropous. *Fruit* small, 2-celled, indehiscent or of 2 cocci, one often imperfect. *Seeds* pendulous; embryo straight in the axis of fleshy albumen; cotyledons  $\frac{1}{2}$ -cylindric, radicle superior.—DISTRIB. Species 140, all S. African, except the European genus *Globularia* and the following.

#### **LAGOTIS**, *Gaertn.* (GYMNANDRA, *Pall.*)

Perennial fleshy herbs. *Leaves* radical and cauline, entire crenate or incised. *Flowering branches* scape-like, ascending, leafy above. *Flowers* spicate or capitate, bracteate, blue or purple, ebracteolate; bracts usually broad, imbricating, as long or longer than the flowers. *Calyx* spathaceous or of 2 sepals. *Corolla-tube* curved; limb 2-lipped, lower lip 2–4-lobed. *Stamens* 2, inserted on the corolla-throat; anthers very large, reniform. *Ovary* 2-celled; style slender, jointed at the base, stigma capitate or 2-fid. *Drupe* small, 2-celled, 1–2-seeded, sometimes separable into 2 indehiscent cocci.—DISTRIB. Species 4 or 5, Arctic Regions and Mts. of N. Asia and N.W. America.

*L. stolonifera*, Koch (*Gymnandra*), a species found from Armenia to Affghanistan, has been collected in Wazuristan, alt. 5–7000 ft., by Stewart, close to the British frontier. It may be known by its small size, narrow leaves, and long stolons.

\* *Calyx* of 2 oblong sepals.

1. **L. globosa**, *Kurz in Journ. As. Soc.* xxxix. 2, 80, t. 7, f. 1 (*Gymnandra*); leaves long-petioled oblong pinnatifid, scape almost naked, bracts much larger than and concealing the flowers suborbicular densely imbricate forming a globose head.

WESTERN TIBET; Therichan Pass, alt. 15–16,000 ft., *Heyde*; Gilgit, *Col. Turner* (fid. C. B. Clarke).